Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

Vol. XI.---No. 7. (NEW SERIES.) NEW YORK, AUGUST 13, 1864. $3 PER ANNUM (IN ADVANCE.)

Improved Rotary Engine.

This rotary engine is constructed on a new principle. It has a sliding piston, A, which is moved from side to side across the piston-wheel, B, in which it fits, by the action of cams inside the cylinder. The piston-wheel is keyed to the main shaft and has a fly-wheel, C, which carries the piston past the abutments at the time when it receives no steam. The piston slides into the enlarged sides, D, of the cylinder, and the full area of its surface is thus exposed to the action of the steam. It is kept steam-tight by a combination of packing, wedges, and springs, which are shown in the section, Fig. 2. One elliptic spring, E, being sufficient to keep the four sides tight in connection with the toggle arms, F, and wedges, G. The body of the piston-wheel is also packed steam-tight where it works between the cylinder-heads at H. There is a steam-chest, I, which has a common slide valve in it, worked by an eccentric, J, on the main shaft. In this model steam is admitted only once during a revolution, and the steam, in order to act on the piston throughout the stroke, passes through the sides of the piston, between it and the wheel it sets in This is difficult to show clearly, even with the aid of drawings. Steam enters the chest through the pipe, J, and exhausts at K, it may be admitted on both sides of the piston if necessary, or can be cut off at any desired point by the use of ordinary appliances for the purpose. This engine consists, therefore, of a single piston sliding in a piston-wheel, the piston changing alternately from one side of the cylinder to the other, and working in scroll-shaped chambers to which it fits accurately. The construction is simple, and it is claimed that the parts are not liable to derangement. It was invented by T. G. Massie, of Port Henry, N. Y., and a patent is now pending on it through the Scientific American Patent Agency. Mr. Massie would like to arrange with some fire-engine builder to construct an engine after his principle. For further information address the inventor as above.

Fig. 1

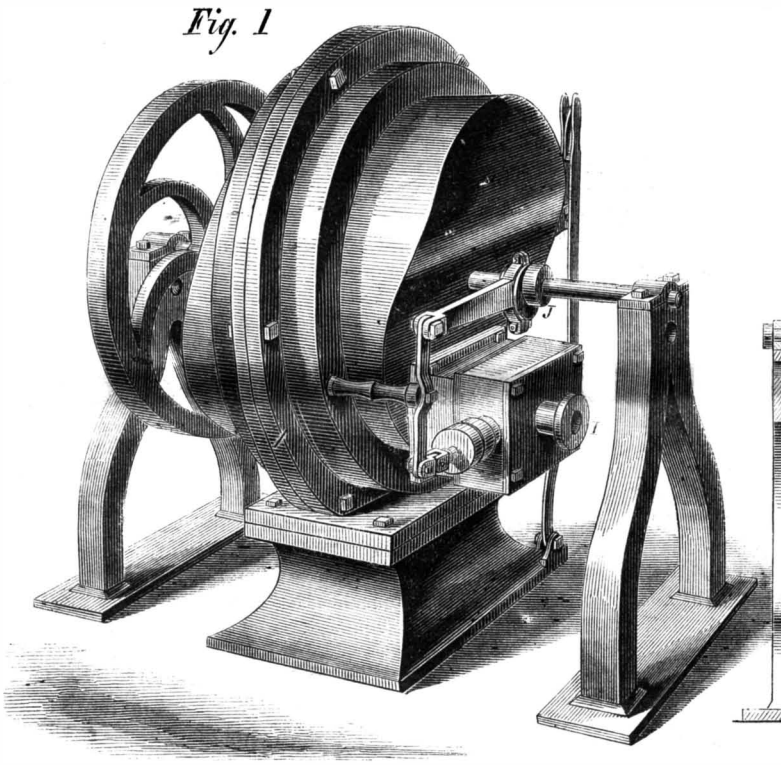
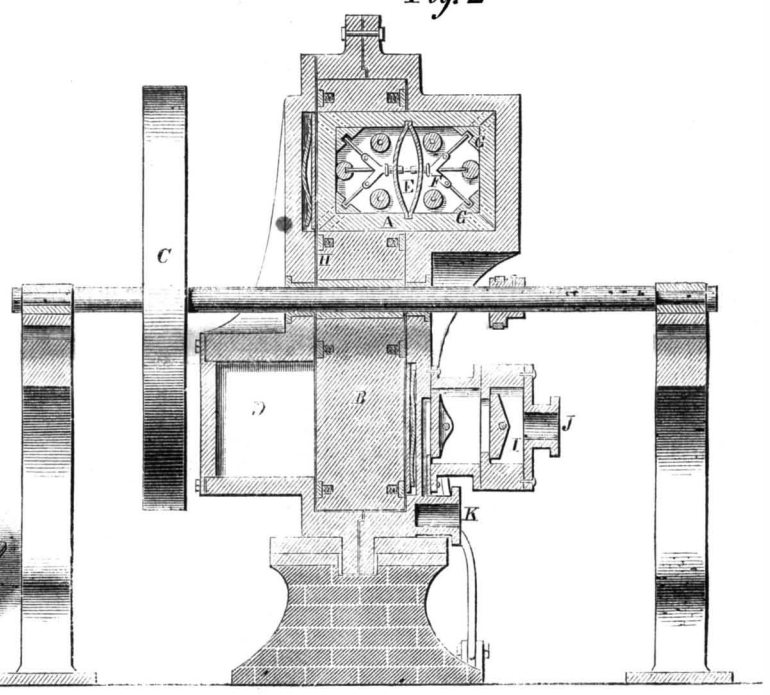


Fig. 2



MASSIE'S ROTARY ENGINE.

The French Government as a Manufacturer.

The one boast of the French Government is the excellence of its administration. The influence of a government on the character of a people, leading them to take care of themselves, teaching them self-reliance and independence of thought and action, and developing all manly qualities on the one hand; or, on the other, depressing them into the condition of grown-up children, with necessity for government guidance at every step of their lives; these considerations never seem to enter into the thought of a Frenchman when discussing the comparative merits of different forms of government. The one question is the perfection of the administration, and in this they claim a very great superiority for the French Government. It is interesting to see how such a well-administered government will succeed when it undertakes the business of manufacturing. Mr. B. Barry, author of *Dockyard Economy and Naval Power*, a work filled with admiring partiality for everything French, gives this account of the Government manufactory of steam engines:

"The French Government, to use a common phrase, is just now, and for some time past has been, moving heaven and earth to develop private ship-building and engine building in France. For this, there has been the double motive of creating a great national resource, and of obviating the necessity of encumbering the dockyards with machinery and tools. Of the tool and machinery question, a broader view has been taken, that it is enough if the tools and machinery exist in France, and that it would be preposterous for the Government to enter into a manufacturing competition in which it would be sure to fail. And it has been warned by the establishment at Indret, in which all the engines were to be manufactured for the navy. Indret is a failure. Like Woolwich, it was too unwieldly to produce any thing at a fair price, or even at a price that could readily be attained; and what was scarcely less serious, the workmanship was inferior. Indret engines were always breaking down, and so serious, sometimes, were the breakdowns, that eventually neither the Minister of the Marine nor the service could trust in them. Indret, therefore, ceased to make engines, and for a time the Clyde, the Mersey, and the Thames were resorted to. An easy effort, however, carried the Minister through the difficulty. He had only to look to private enterprise in France, and it has been said of M. Mazeline, of Havre, that when favored with the first Imperial order, he publicly took the novel course of at once dispensing with the services of English workmen. Now in M. Mazeline's establishment at Havre, France possesses one of the best engine shops in Europe. Two more are situated in the Gulf of Lyons, which are not much inferior. Then, as to the ship-yards, there is M. Gouin's at Nantes, M. Armand's at Bordeaux, and one of La Seyne Company at the head of Toulon harbor; all yards turning out the largest class of iron-clads. The Havre establishment of M. Normand is also quite as capable. By intelligent Government support of private industry, the most cordial assistance towards the improvement of harbors and the construction of docks, the naval resources of France within the last few years have been doubled."

INCREASE OF INSANITY.—On January 1, 1849, there were 6,931 patients in private asylums and 7,269 in public. In the former there are now only 4,455, and in the latter as many as 23,830. The Commissioners in Lunacy exercise a watchful care over the welfare of 44,695 persons of unsound or defective intellect.—*London Chemist and Druggist.*

UNDER the new tax law, which went into operation on the 1st of August, receipts for money over $20 require a stamp of 2 cents, the same as bank checks. A note for $100, which paid one cent under the old law, will now pay five cents, and the same for each additional $100, or fractional part thereof.

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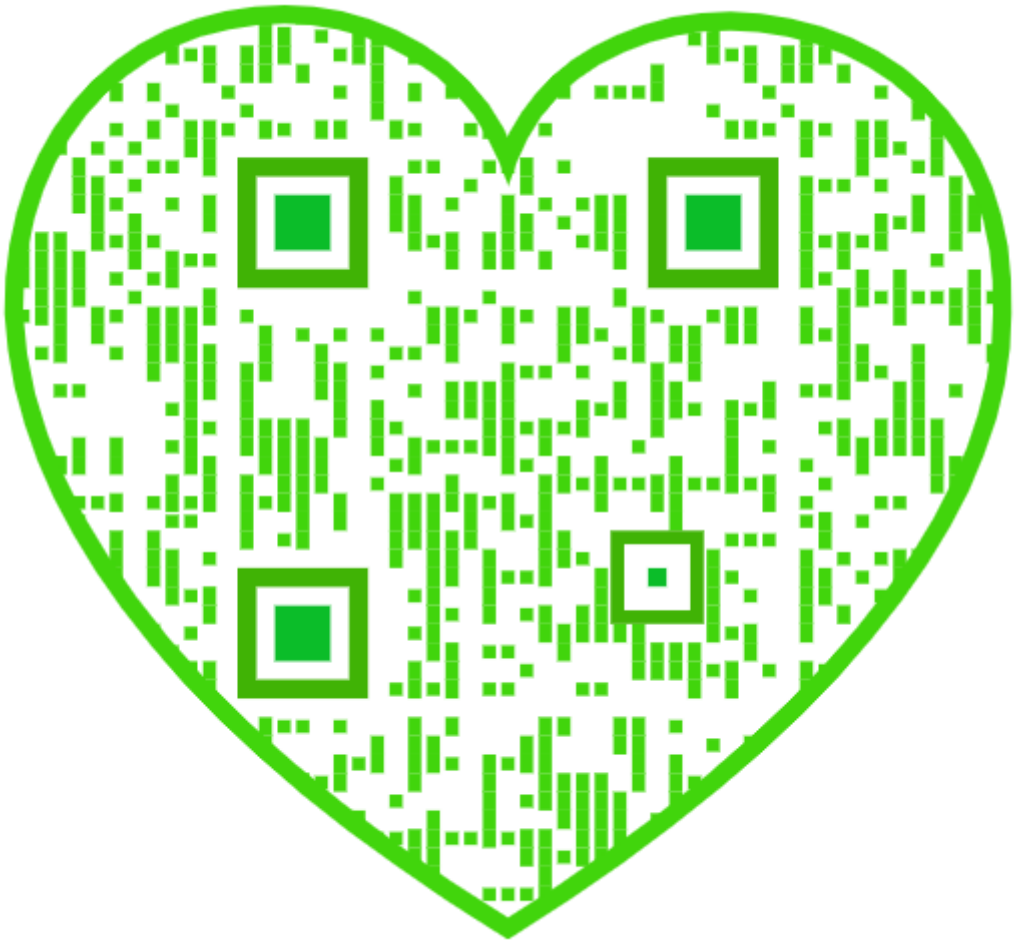

The Ames Company's Works.

These had a humble beginning as long ago as 1829, when N. P. Ames commenced the manufacture of cutlery, employing nine workmen. The business rapidly increased, however, and in 1834 the Ames manufacturing Company was incorporated with a capital of $30,000, which has since been swelled to $225,000, this being now no adequate representation of the extent of the business, as their monthly pay roll is frequently one-tenth of that sum.

Until the breaking out of the rebellion, the Ames company were the only sword and saber manufacturers in this country, and they are now by far the largest. They have had several contracts from the Government, and have now nearly completed one for 21,000, which they have been filling at the rate of 1,600 per week. In the shops where scabbards are made no less than three grindstones, weighing 5,000 to 600 pounds apiece, are used up every month. For costly presentation swords the Ames company have long been famous. One of this kind was presented a few months since to General Grant and another more expensive one to General Oglesby, and two that were made to order were forwarded, the other day, to the two kings of Siam. That presented to General Oglesby was undoubtedly the most beautiful sword ever made in this country. In 1836 the Ames company erected a factory for casting bronze cannon, and have since kept it in continual operation. Of these they are now casting ten a-week, the work going on night and day. Twelve and twenty-four pounders are made, as well as twelve, twenty-four, and thirty-two-pound howitzers, and the Cohorn mortar, an exceedingly effective affair, weighing but 160 pounds and used only for siege purposes. A contract from the Government for five hundred of these mortars, received three or four weeks ago, is now about filled. A considerable force is employed constantly in the manufactur of projectiles—shot, shell and canister. James's has been the principal shell made heretofore, but Emery's, which is highly commended in some quarters, is now also made.

The Ames company have acquired more than a national reputation for very large and heavy castings. Almost every large statue of note in the country was cast at their establishment, and they have now in preparation Ball's colossal equestrian statue of Washington, the model of which is cut up ready for casting. It will not be completed, however, for a year or two. The expense of casting will be about $20,000. Heavy iron castings on private account have also been a speciality with the Ames company. Among those now making is a crusher, for separating ores, that weighs 130,000 pounds, and is in great demand by mining companies.

As manufacturers of cotton, gun and other machinery of the very best quality, the Ames company are widely known. Their name on a machine is everywhere taken as an undoubted stamp of its excellence, and their machinists' and gunsmiths' tools and gun stocking machines are specially famous. With the latter they have not only supplied all the armories in this country, but in 1853 fitted up for the English Government the small-arms factory at Enfield, where almost all of the labor had previously been done by hand, and have since performed similar service for the Russian and Spanish Governments. They have also executed large orders for machinery from the London armory company, and orders are now going over for a small-arms establishment at Birmingham, which is to be the largest private armory in England. Among the machines they have recently completed is one for rifling cannon of any size, which is to be sent by the Government with an engine to drive it, wherever there are smooth-bore guns that it is desirable to rifle. Turbine water-wheels are another speciality with the Ames company and are made in large numbers, the sizes varying from two to eight feet in diameter. Fifty or sixty men are employed in the manufacture of plated silver-ware, and many more would be if they could be obtained. Some solid silver work is made on special orders, but the bulk of the business is plated sets for hotels and steamboats.

THE ATLANTIC TELEGGAPH.—The landing of the American end of the Atlantic cable will at Heart's Content, one hundred miles from Placentia, Newfoundland.

Rapid Traveling!

Westcott's "Life of John Fitch," contains the following passage:—

The steamboat *Car of Neptune*, which left this city on Saturday evening last, at five o'clock, arrived at Albany in 20 hours. She returned this morning in 22 hours—equal to 330 miles in 43 hours. Let foreigners who say we have no talent for improvement, point out where there is any mode of conveyance equal to this! In what country are there so many enjoyments combined in one great polytechnic machine, and mounted with wings, as this, which wafts passengers as by enchantment between the cities of New York and Albany? To our countrymen, then, and our arts, let justice be liberally and honestly measured out.

[There is considerable difference between 22 hours and 7 hours, the latter time having been made between the points in question. A steamboat of the present day would have made our ancestors stare as much as one of their antiquated machines and craft would now cause us to smile.

The London "Times" on the Shoeburyness Experiments.

From a long article in the London *Times*, on the great trial of the Armstrong and Whitworth guns, we make the following extracts:—

"Shoeburyness has not been established all these years without having had to go through its share of experiments which have been found worthless when tried, and experiments which were known to be worthless before they were tried at all. Yet we venture to say that few more valueless in its result either for ships or guns have ever been made than those which have just concluded between the competing seventy-pounders of Sir William Armstrong and Mr. Whitworth against a *Warrior* target. What comparative results the special committee may draw from this portion of the programme of course we cannot say, but every one at Shoeburyness knew from the commencement that it was a mere folly and waste of time to fire such light ordnance as seventy-pounders against iron targets at all. The result has only been what all foresaw and told. The target is just so much shaken as to make it useless as a test for heavier ordnance, and just so much uninjured as to prove that men under its cover might have slept with the most perfect confidence, and let both competitors hammer away as they pleased. This is an unsatisfactory return for the large outlay this ordnance competition will cost the country; and, what is more unsatisfactory still is, that we must look for no better so long as the competition is confined to seventy-pounders.

"In the meantime the supply of rifled guns to the forts and fleet stands still, while all Europe and America are manufacturing them by hundreds. The importance of the time we are now losing may not be remembered if we remain at peace—it will never be forgotten should we unfortunately become involved in war. Rifled guns cannot be manufactured off-hand by scores like the cast-iron rubbish of old; and the worst rifled gun is better than the best smooth-bore ever cast. The most uncompromising partisan of Armstrong or Whitworth will always admit that they are both admirable guns—the best, certainly, that are known to exist in any country.

"One of the most recent stages of the competition with the twelve-pounder field-guns was made with their trails buried in the ground, so as to enable the guns to get the enormous elevation of 33°. Several rounds were fired, and at this contest for range Mr. Whitworth gained a most clear victory, as, indeed, in the matter of range, he had throughout been more or less ahead of the shunt-gun. This, indeed, was to be expected, from the much smaller circular area, and therefore diminished resistance, of his shot. But what at trials of 6, 8, or 10° had at most only been 400 yards, at 33° rose to a formidable gain. In rough numbers Mr. Whitworth averaged the immense range of 8,800 yards, a little short of five miles—and Sir William's shunt-gun averaged about 6,700 yards, or short of four miles—an increase of range to Mr. Whitworth of nearly a mile and a quarter. Even if we call it only a mile, this is a most important advantage. It may be said that field guns are rarely, if ever, wanted to be used at this elevation, which is true enough; but it is equally true that the gun which possessed it, in addition to other qualifications, is in range by so much the better gun; and unless the committee consider that what is gained in superiority of range by diminished area of shot is lost in efficiency as a shell gun, this victory of Mr. Whitworth's must weigh seriously in their decision."

American Emigrant Company.

In our advertising columns last week will be found the announcement of an enterprise so novel as to make its inauguration a matter of general interest. It is the formation of a company with a large capital, to aid laborers in traveling to the parts of the country where work is in great demand.

The mode of operation adopted by the Company is as follows:—Parties desiring to import workmen through its agency are required to forward information as definite and explicit as possible, stating the exact qualifications of the men required; on receipt of this order, instructions will be sent to the proper agent located in the country where the men are to be obtained. This agent has as careful a selection made as is possible of the men needed, and contracts with them for their services for a certain time to be specified, undertaking to pay them the current wages in this country for such work, or to make such special rates as may be ordered, the terms and conditions of the contract to be stated with the utmost precision in the instrument, which will be executed with due legal formality, and in accordance with the regulations established by the Commissioner of Immigration. The men thus contracted with are duly transported to the nearest shipping port, and thence to New York, where they come under the immediate supervision of the Company, and are at once sent to their destination; and, where it is desired, or where large numbers of men are required, for one interest or one neighborhood, special agents are sent, upon reasonable terms, to conduct them the entire way; and it is determined by the Company, if any unreasonable delay should arise in importing men, by reason of the difficulty of procuring passages across the ocean by the ordinary lines of passenger ships, or if, for any other reasons, it shall prove expedient, to charter vessels for the purpose of transporting exclusively emigrants coming under its auspices and consigned to its care.

Those who do not desire to import workmen in the manner thus indicated, but prefer depending upon the supply of labor furnished by ordinary immigration, can have their orders filled through the agency of the American Emigrant Company, whose arrangements with the emigration authorities are such as enable it to make selections at the moment of landing, from the newly-arrived immigrants, of those who seem the most suitable for the objects of its patrons, and contracts have been made, on the most favorable terms, for the transportation to all points of the interior of the employes thus selected.

Simple and Ingenious Wine-press.

A very ingenious, inexpensive, and simple wine-press is made use of at a vineyard near Castlemaine, Victoria. Advantage is taken in the vineyard of a strong overhanging branch of a gum tree, which is used as a fulcrum; under this a common screw-jack is fastened to a strong frame-work in a hogshead, which hogshead has a false bottom perforated with holes. The grapes are placed over this false bottom, and the screw presses the juice through the holes. A wooden tap is at the bung of the cask, and as the space fills, the juice of the grape is drawn off in buckets. As an ordinary wine-press costs, in Victoria, from £25 upwards, this simple and practical "make-shift" is worth knowing. We understand that in consequence of the large quantities of wine manufactured in Castlemaine, the demand for casks is greater than the supply, as high a price as twenty-five shillings per cask being given.

COST OF STEAM BOILERS IN DIXIE.—A firm in Selma, Alabama, recently made to order, for a citizen of that place, a small steam boiler, etc., without special contract as to price. The gross weight of all the metal furnished was less than 1,500 lbs. The amount of their bill was $31,000! Payment of the bill was refused, on the ground that it was exorbitant. The matter was referred to arbitrators, who, after full investigation, decided that the amount which could be justly claimed by the boiler makers was $12,132, or $18,000 less than the bill.

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The Cactus Plants of California.

The San Francisco *Bulletin* says:—"The cactus—that celebrated family of the floral kingdom, the glory of the hot-houses of Europe and the wonder of travelers, whose flowers and fruits are seen in every league of surface in South California, Arizona and the Peninsula—has never sufficiently attracted the attention of our florists or farmers. Fifty-five species of cactus are known in the botany of these sections, and they include some with magnificent flowers and of extraordinary appearance, forming beautiful ornaments when in the vicinity of other vegetation. If the different species, all covered with thorns, could be got together in a California garden they would form one of the most singular and unique displays it is possible to conceive in gardening, and it is to be remembered that the fruits are as valuable for human food as the flowers are for feasting the eye.

"The cactacia have an immense range in the altitudes of central North America, or in what we may term the California *simulacra* of climates and soils, as they are found from the parallel of Cariboo to Cape St. Lucas, and from the eastern slopes of the Rocky Mountains in North Dacotah to the Gila river. They are met with in all latitudes between the Gila and Panama, from the hue of perpetual snow to that of the sea shore. Some two hundred different species of this singular family of American plants are enumerated in the botany of Mexico, ranging from the shape of a cabbage to that of a grape-vine, and looming high as a tree and umbrageous as a small oak. Their flowering is of extraordinary splendor and loveliness, and is from the purest white to vermilion, including every mixture of the prismatic colors. But it is the fruit, the stand-by of the poor and the Indians in the seasons of draught and famine, that unfolds this providential blessing of the desert in all its value.

"Engelman of St. Louis, an eminent writer on this family, enumerates as indigenous to Arizona and South California four genera of the cactus; that is, thirty-seven species of the opuntas or lobe shape, eleven species of the cereus or perpendicular stems, six eumamalarias or mamacs, and six echinocactus or cabbage-heads. Almost every one of these is found in the mountain ranges and deserts of Los Angeles, San Bernardino and San Diego counties. In Lower California many species are met with which are foreign to our parallels and latitudes, one of which, a climbing variety, is found in the dryest months to be full of the purest water. One of the opuntas has a small fruit, specific in scurvies and blood impurities, while others have fruits with the flavor of pineapples, of strawberries, peaches, plums and cherries, of the luscious cheramoya and mangostein, of the fig and grape, and of the lemon, apple, and pear.

"The *Cactus Opunta*, or Indian fig of Mexico—white and red—was introduced into the mission gardens of our State from Santa Clara to San Diego in the early settlement of the country, some seventy years ago; but they are also found indigenous in the mountains of the Colorado, in San Bernardino and San Diego counties. Near all the southern missions below Point Conception they grow luxuriantly, particularly at Santa Barbara, San Fernando and San Gabriel. At the two last-named places they are extremely abundant and luscious. These varieties of the prickly pear are valuable additions to the food of our State, as the fruit is not only very plentiful in summer and fall, but it is highly nutritive and agreeable, and can be gathered at will, and the plant requires no care. When stripped of the prickles they can be boiled down to an excellent conserve or sirup, or dried in the sun for preservation, as they contain a large quantity of sugar and gum. The plant is easily propagated by slips or seeds, and has a wonderful endurance, vitality and hardiness. It comes to perfection in three years. Its seeds, which are very abundant in the fruit, are toasted by the Indians as a substitute for corn. The mucilage of the leaves or fronds is thrown into water and used in making cements and whitewashes, and gives great strength to those house-building materials in the arid districts of Mexico. It is in common use around Los Angeles.

"Being such plentiful and excellent producers of sugary fruit, so necessary to the laboring man in our dry and attenuated atmosphere, this matter should be attended to by our people, as well as the arts of making molasses from maguey, pumpkins, melons, watermelons, grapes, pears, beets, corn stalks, and the wild sugar cane or panoche-carisso of the Tulares. All these fruits are well known to the Indians and Mestizoes of Sonora and New Mexico, and those of Chihuahua and Coahuila, as producing sugar; and particularly the Cactacea and Agave, among the Pimos and Papagos of Arizona, who consider the cactus and the maguey as gifts of the gods, for from them they receive food, clothing, shelter and fencing. The reduction of these articles to conserves and molasses is often facilitated among these simple people by a concentrating process of roasting and baking, and boiling down slowly afterwards, with a little water, to a viscid sirup which never ferments in their keeping, though several of them are also used in the fabrication of moscal or spirits. Of such an exhilarating quality is this fire-water that when 'in the spirit' they would not give a *cluquo* to call themselves king, priest or judge, for they often give for such alcoholics weight for weight in silver, and bless the vender for his trade."

Dr. Emmons.

Among the contents of the "American Cyclopædia" for 1863, noticed in another column, are obituaries of the prominent persons who died during the year. From the article on Dr. Emmons we make the following extracts:—

"Emmons, Ebanezer, M.D., an American geologist and author, born in Middlefield, Berkshire county, Massachusetts, in 1798, died at Brunswick, North Carolina, October 1st, 1863. He graduated from Williams College, Mass., in 1818, and having selected the profession of medicine, pursued his course of medical studies at Pittsfield and elsewhere, and received his diploma after the organization of the Berkshire Medical Institute, in 1830. He soon became a successful practitioner, but his tastes led him to cultivate with great assiduity the natural history in Williams College, the first professorship of that kind, we believe, ever established in this country. In this position he made important contributions to the knowledge of the botany, geology, and mineralogy of New England and the Northern States, and assisted in the natural history survey of Massachusetts, preparing the 'Report on the Quadrupeds' of the State.

"When the geological survey of New York was undertaken, Dr. Emmons was appointed one of the 'geologists-in-chief,' and had also assigned to him the department of agriculture; and his reports constitute some six or eight of the most valuable volumes of the well-known 'Natural History of New York' series. It was while engaged in this labor, and subsequently, the interesting incidents hereafter alluded to occurred. Prior to the commencement of the new geological survey, our knowledge of American geology was exceedingly confused and indefinite, and no clear ideas had been arrived at, as to what were the oldest fossiliferous rocks of the continent, or as to their location, extent, or the nature of the former life-evidences contained in them. The survey of Massachusetts and Connecticut had indeed been made, but in neither of these States were the requisite data for making a general classification of the older American rocks to be found. In the broad territory of New York, however, it was seen from the first, that the clue to the enigma was obtainable, and soon after the commencement of the survey, evidence was accumulated, demonstrating that the divisions of the older fossiliferous rocks worked out and established in Great Britain, and on the continent of Europe, could be recognized also in North America, and that the period of their formation was, in part at least, contemporaneous. In conformity with these views, therefore, the New York zoologists adopted the nomenclature of the English classification, and grouped the oldest series of stratified fossiliferous rocks, found in their State, into one system, called the 'silurian;' the oldest and lowest member which the 'Potsdam sandstone' was considered as representing, with its few fossils, the epoch when animal life first dawned on the North American continent. The determination of these data was a matter of very great importance, inasmuch as the position of the oldest and lowest fossiliferous strata is the starting point for the classification of enormous series of other fossiliferous rocks that are superimposed, and which were consequently formed subsequently. It is also the starting point for reckoning geological time comparatively; and the point from which animal and vegetable life, commencing in few and humble forms, is traced upward, expanding, succeeding, possibly developing and transmuting.

"From this opinion, namely, that the silurian system of New York includes the oldest American fossiliferous rocks—an opinion in which all at first acquiesced—Dr. Emmons came gradually to differ, and after continuing his investigations for some years, he at last unhesitatingly announced that beneath the oldest member of the silurian system, there was another series of stratified rocks, of enormous thickness, representing a life-period on our continent of much greater antiquity than any before recognized, and an epoch of time, in comparison with which the silurian era seems modern. To this system, from the circumstance that the rocks included in it are extensively developed in western Massachusetts and Vermont, Dr. Emmons applied the name 'Taconic.' To it also have been assigned the rocks which constitute the western face of the Green Mountains, extending from Canada to Georgia, the well-known Berkshire and Vermont limestones and marbles, and extensive beds of slates and sandstones in the Lake Huron and Lake Superior districts, and in Virginia, North Carolina, Tennessee, and Arkansas. The announcement of Dr. Emmons's views was received by geologists and naturalists generally with skepticism, partially, we suppose, through the natural unbelief which almost always attends the promulgation of any startling new truth, and partially because British and continental geologists—the recognized authorities of the time—had not then announced any analogous discovery; and this skepticism, either through jealousy of the brilliancy of the discovery, in case it was substantiated, or ill-will at having pet theories rudely knocked over or disturbed, soon ended in persecution.

"But justice, long delayed, came at last. In conducting the geological survey of Canada, instituted subsequently to the New York survey, a Canadian geologist came to the conclusion of Dr. Emmons, that the silurian system did not embrace the oldest and lowest of the American fossiliferous rocks; but, ignoring the former discovery of that fact, he classified the ante-silurian strata, which are now believed to correspond with the upper and lower groups of Dr. Emmons's Taconic system as the 'Huronian and Laurentian' systems. Following hard upon this, ante-silurian formations of fossiliferous rocks were discovered in Sweden and Bohemia, and distinguished geologists in both these countries, recognizing the correspondence between their primordial formations and their contained fossils with those described by Dr. Emmons in America, made haste to announce the fact and to award praise and credit to the American geologist for discoveries made, but not believed in, some fifteen years previously. Within a comparatively recent period, also, the Canadian geologists, reviewing their work, have obtained evidence which compels them to admit that their former hypotheses were wrong, and that the opinions of Dr. E. were in all probability wonderfully correct. And indeed so overpowering is the evidence accumulated in favor of the Taconic system, that most of the American scientists have ceased their opposition, and showed themselves ready to award praise and honor to where they formerly gave ridicule and contempt. Of the extent to which his reputation and discernment have been vindicated, Dr. Emmons, however, was never probably fully aware. In 1858-'9, he was appointed by the Legislature of North Carolina to conduct the geological survey of that State. Here he rendered further essential service to science by determining the probable geological age of the belt of red sandstones and shales, which, occupying the valley of the Connecticut, stretch along the eastern slope of the United States as far south as North Carolina, and whose period of deposition has always been one of the varying problems of American geology.

The breaking-out of the rebellion found Dr. E. still in North Carolina, prosecuting the survey, and here, either through inability to leave, or from a desire to protect certain mining properties, he remained until the time of his death, cut off from all scientific or other communication with his Northern friends and associates. It has been surmised that, on ac

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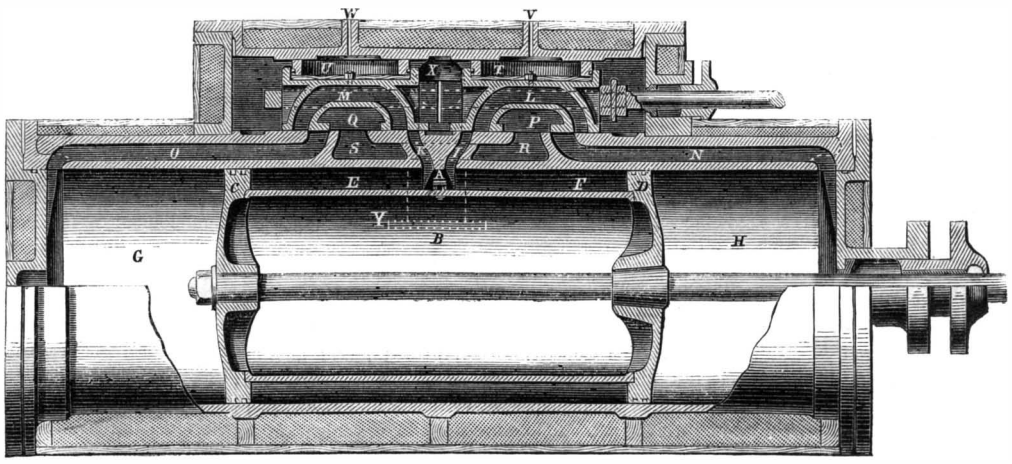
count of his knowledge of the State and its resources, he was detained a prisoner on parole by the Confederate Government."

Double-expansive Single-Cylinder Steam Engine.

We find in the *Mechanisc' Magazine* (London) an elaborate illustration and description of a steam engine so novel, that we reproduce the essential parts for the interest of our readers. Our contemporary says:—"During the last few days we have had an opportunity of examing the first of an entirely new class of steam engines, patented by Mr. E. E. Allen, of Parliament Street. The engine in question is employed at the new Foreign Office (now in course of erection by Messrs. Smith and Taylor) in giving motion to a set of stone-sawing frames.

"The engine is an 8-horse portable one, constructed by Messrs. R. Hornsby and Sons, of Grantham, and originally intended for competition at the Worcester Show of the Royal Agricultural Society, but not completed in time. It may be described as a double-expansive single-cylinder engine, the expansion being carried down very nearly, or quite, to the atmospheric line. Care has been taken to reduce the friction by relieving the slide valves of the pressere of the steam upon them.



ALLEN'S DOUBLE EXPANSION ENGINE.

"In the engine above referred to, the cylinder is placed in the steam space over the fire-box—an arrangement peculiar to the portable engines of Messrs. Hornsby. The cylinder is thus maintained at a uniform temperature—a matter of much importance when steam is worked very expansively, and especially when it is not in any way superheated.

"The engraving shows a section of the cylinder and valves of a pair of 20-horse horizontal high-pressure engines (not precisely the same plan as the portable and fixed engines above noticed) now in course of construction by Messrs. Benjamin Hick & Son, of Bolton, who have also just completed another 20-horse rotating tubular boiler of steel. These engines are 20-inch diameter, with 16-inch trunks, and two feet six-inch stroke, and are intended to make about fifty revolutions per minute, and expand down to the atmospheric line. By reference to the figure, it will be seen that the cylinder is made double the length of the stroke, and has a division A, in the center, through which the trunk, B, passes; the division, A, being packed the same as a piston, the rings, however, having a spring inwards instead of outwards. At either end of the trunk are light covers, or pistons, C D, which are held together by the piston rod, as shown. In starting the engine, steam enters through the port, K, into the annular space, E, where it may cut off at 5-8ths of the stroke by the lap on the valve. When the stroke is completed, the steam from the annular space escapes through the port, K, by which it entered, passes through the passage, M, in the valve and into the port, O, and so to the end, G, of the cylinder, where it expands to the atmospheric line, or, as far as may be desired—if in a condensing engine, to a few pounds above a vacuum. Upon the stroke being again commenced, the steam in G passes out through the port, O, into the valve, Q, being exhausted at S. It will be, of course, seen that, by this arrangement, steam of almost any pressure may be *fully* expanded; the expansion (besides that given by lap), being in the ratio of the area of the annular space to that of whole cylinder; the effective pressure of the expanding steam being on the area of the trunk. The action of the other end, H, of the cylinder is precisely the same as that just described; steam from the boiler entering through I into the annular space, F, passing thence through I, L, and N to H, and, when fully expanded, again through N to P and out at R; the exhaust ports, R and S, being united in the exhaust pipe, Y. The steam pipe is shown entering the side of the valve case at X. The valves, altbough for convenience cast separately, are moved by the same rod and bridle, distance pieces being cast upon them so as to bring them over the ports, as shown when in their central position. To relieve the valves of the steam pressure, cast-iron rings, T and U, are placed on the backs of the valves, having small gun-metal packing rings fitted in grooves formed on their outside circumferences, such packing rings making steam joints on the inner side of rings cast on the valves themselves. The rings, T and U, are kept to the face of the valve chest by light springs; or rings of rubber may be used and the gun-metal packing dispensed with. The tubular openings, V and W, communicate with the atmosphere, and are, of course, always open. The ports, I and K, as well as the passages, L and M, through the valves, may be made proportional to the area of the annular space only; the ports, H and O, being made proportional to the area of the cylinder. The trunk and its covers may be made very light—indeed, little if anything heavier than an ordinary piston—the form of both trunk and covers being very strong, to resist external pressure. In some cases, Mr. Allen proposes to modify this form of engine—1, by casting the trunk double of two thicknesses, leaving narrow passages between them and fitting a stationary piston within the trunk itself; and, 2, by forming in the pistons, valves which would allow of the steam passing direct from E to G, or from F to H; the slide valve being then made without the passages, L and M.

"The adoption of this arrangement also enables old engines to be altered so as fully to expand their steam, simply by fitting new cylinders to them, inasmuch as, although the cylinder area is increased, the total work on the piston, connecting rod, &c., remains the same. The full or complete expansion of the steam does not render a heavy fly-wheel necessary, as in the annular space a good pressure is maintained to the very end of the stroke; thus, in many cases, enabling a single cylinder to be used where two are now employed, with all their duplication of working parts, such as guides, connecting rods, cranks, eccentrics, &c.—a single eccentric rod in the new engine being all that is necessary for ordinary pressures, although complete expansion is required.

"In the trials made with these engines, the economical results obtained have been higher than those given by ordinary single-expansive engines with separate cut-off valves; the lightness ef many of the moving parts, and the relief of the valves from the pressure of the steam, much more than compensating for any friction of the trunk-piston.

"The consumption of the 8-horse portable engine at the Foreign Office is only from 3 to 4 cwt. of common gas coke per day, as against more than double the weight of coal consumed by the ordinary engines of this class and power by the best makers. We shall be anxious to learn the results of a trial on a locomotive of this form of cylinder, and will take care to inform our readers of them as soon as possible."

Exodus of Mechanics.

A large number of mechanics—men selected for skill and excellence as workmen—left Hartford, Conn., for Nashville, Tennessee, where they are to be employed on Government work at $3, $3 50 and $4 a day, with board and lodging furnished gratis by the Government. Among them were a score or more of workers on engines or locomotives, and the balance included machinists and other classes of good workmen. The engine builders are promised $4 a day and board. A Government agent is in Hartford to procure these workmen, and their transportation to Nashville is at Government expense.

How to make Ice Cream.

Ice cream is usually considered a luxury not to be indulged in by farmers' families. It is set down as a city dish, though most of the articles used in its preparation are obtainable from the country. It is not generally known that the best ice cream can be made without a costly freezer, in any family where ice and milk are at hand. To make it, proceed thus:—Take two quarts of fresh milk—if a little cream be added all the better, though ice cream as ordinarily made is innocent of cream. Scald the milk, stirring in three table-spoonfuls of corn starch or arrow-root to give it body. These may be omitted, if not at hand. Stir well to keep from burning. Beat up four to eight eggs, according to convenience or as a rich dish is wanted, and pour the scalding milk on the eggs, stirring well. When cold add sugar and essence of lemon, or extract of vanilla, to suit the taste. A very little salt also improves it. Pour the cooled contents into a deep tin pail or can holding about three quarts; put on the cover, and set in an ordinary wooden water pail. Pound up ice to the size of hen's eggs and less —some of course will be quite fine—pack it around the tin can, mixing in about one pint of either medium or fine salt. Pack this till it reaches nearly to the top of the can containing the mixture to be frozen, but be careful none enters it. Now move the tin can or pail around by means of its bail, lifting the cover occasionally to scrape off the frozen cream on the inside, so that other portions may come in contact with the freezing surface. From fifteen to twenty minutes will be sufficient, and the dish may be served up at once or set away, without removing from the wooden pail, in a cool place for several hours, covering with a flannel cloth. Try it, and see if you need hereafter forego the ice cream because no freezer is at hand.

A Curious Kite.—In the early part of last week two boys were flying a kite at Germantown, Pa.; the kite not flying as well as they desired, they pulled it down to adjust the bobs of the tail. A gentleman passing by, attracted by the efforts of the boys, came towards them, and examined their work. To his surprise he saw that on the stick was pasted a five-twenty bond, of the value of five hundred dollars. Taking the bond he accompanied the boys home, and found that their mother had picked it up in the street, and, ignorant of its value, had kept it on account of the engraving, which she thought a collection of pretty pictures. It belonged to a neighboring gentleman, who was much surprised at the return of his property, and still more astonished at the way in which it had been recovered.—*Philadelphia News.*

Good Advice for the Times.—The last number of *Thompson's Bank Note Reporter* makes the following sensible and truthful remarks:—"Better take half—three quarters—yea, *all* you have, and *give* it to your country, rather than not have her ride successfully through this rebellion; for what are your houses and lands—your deeds and mortgages, your stocks and chattels worth—and can you even retain your bags of gold—if the Government is not sustained? The breaking-up of the Government is the rich man's doom."

Dampness will cause honey to become thin and watery.

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THE HECKER AND WATERMAN EXPERIMENTS.

The plan of these experiments is to try four series —in two of them working the engine as a condenser, and two working the engine as a non-condenser. In one of the two in which the engine is worked as a condensing engine, the cylinder is surrounded by a steam jacket, and in the other it is not. The same division is also made in the two series in which the engine is worked as a non-condensing or high-pressure engine; one object of the experiments being to ascertain the effect of the steam jacket under various conditions. Each series of experiments embraces four trials of thirty hours each, with the steam cut off at four different points, $\frac{7}{8}$ths, $\frac{2}{3}$ds, $\frac{1}{2}$, and $\frac{1}{4}$th of the stroke; the effect of each of these measures of expansion being tried under the different conditions.

We have given the results in three of the series, the two in which the engine was worked as a condensing or low-pressure engine, and one in which it was worked as a non-condenser. The other series is all completed with the exception of one run of thirty hours, in which the steam is to be cut off at one-fourth of the stroke. As the shafting was found to be slightly out of line, before completing this series it is proposed to repeat some of the others, and if any material difference is discovered in the results we shall give the figures. In the meantime we give Mr. Waterman's measures and computations of the condensation of steam in the three series of which we have given the results.

Mr. Isherwood points out, in his "Engineering Precedents," the way in which a large quantity of steam is condensed in the cylinder of a steam engine, and again evaporated without doing any useful work. Suppose an upright cylinder, and consider the action below the piston. The cylinder above the piston is somewhat cooled. As the piston rises, the steam below it comes in contact with the cooled inner surface of the cylinder, and is condensed upon it in the form of a thin sheet of moisture or dew. When the lower exhaust port is opened, the pressure of the steam in the cylinder is greatly reduced, and the dew upon the walls is instantly reconverted to vapor; absorbing in the process heat from the walls of the cylinder. As the steam which is formed by this re-evaporation is in open communication with the condenser, it is pushed out of the cylinder without doing any work, while the heat which it takes from the walls of the cylinder has to be supplied by new steam from the boiler, which is condensed in supplying it without doing any good. Thus all of the steam condensed in the cylinder is wasted. It is a very simple matter to ascertain the quantity of steam condensed in this way, and the proportion to the whole that is evaporated in the boiler is surprisingly great, ranging from 8 to 50 per cent. A certain amount of condensation necessarily takes place in the condenser due to the work done; and what this is can be readily calculated from the amount of work which a given quantity of heat will perform, as ascertained by Meyer and Joule. That branch of the subject, however, we prefer to discuss in a separate article.

The method by which Mr. Waterman ascertains the quantity of steam condensed on the working side of the piston is this. He weighs the water which is put into the boiler, and deducts from this the weight of steam remaining at the end of each stroke of the piston. The latter is obtained by measuring the pressure at the end of the stroke by means of the indicator, and then calculating the weight of the steam from the specific gravity corresponding to this pressure, and the measured volume of the cylinder.

We give the amount of condensation in the cylinder in the three series of experiments which are finished.

The series tried from May 17th to May 27th; engine worked as a condenser, without steam in the jacket

Pounds of feed-water pumped into boiler from tank—

$\frac{7}{8}$ths cut-off	16,622
$\frac{2}{3}$ds cut-off	14,981
$\frac{1}{2}$ cut-off	14,568
$\frac{1}{4}$th cut-off	12,826

Pounds of steam in cylinder at end of stroke—

$\frac{7}{8}$ths cut-off	10,359
$\frac{2}{3}$ds cut-off	8,334
$\frac{1}{2}$ cut-off	7,912
$\frac{1}{4}$th cut-off	6,313

Percentum of steam condensed in cylinder—

$\frac{7}{8}$ths cut-off	37·8
$\frac{2}{3}$ds cut-off	44·3
$\frac{1}{2}$ cut-off	45·7
$\frac{1}{4}$th cut-off	49·2

The series tried from May 12th to June 4th; engine worked as a condenser, steam in jacket.

Pounds of feed-water pumped into boiler from tank—

$\frac{7}{8}$ths cut-off	12,901
$\frac{2}{3}$ds cut-off	11,267
$\frac{1}{2}$ cut-off	11,188
$\frac{1}{4}$th cut-off	9,632

Pounds of steam condensed in steam jacket—

$\frac{7}{8}$ths cut-off	463
$\frac{2}{3}$ds cut-off	450
$\frac{1}{2}$ cut-off	498
$\frac{1}{4}$th cut-off	535

Pounds of steam discharged from steam pipe and valve chest—

$\frac{7}{8}$ths cut-off	443
$\frac{2}{3}$ds cut-off	470
$\frac{1}{2}$ cut-off	431
$\frac{1}{4}$th cut-off	497

Pounds of steam in cylinder at end of stroke—

$\frac{7}{8}$ths cut-off	10,144
$\frac{2}{3}$ds cut-off	8,136
$\frac{1}{2}$ cut-off	7,337
$\frac{1}{4}$th cut-off	7,728

Percentum of steam condensed in cylincer—

$\frac{7}{8}$ths cut-off	15·4
$\frac{2}{3}$ds cut-off	21·3
$\frac{1}{2}$ cut-off	28·4
$\frac{1}{4}$ths cut-off	10·1

The series tried from April 1st to April 26th; the engine worked as a non-condenser, steam in jacket.

Pounds of water pumped into boiler from tank —

$\frac{7}{8}$ths cut-off	15,571
$\frac{2}{3}$ds cut-off	13,056
$\frac{1}{2}$ cut-off	12,604
$\frac{1}{4}$th cut-off	10,394

Pounds of steam condensed in steam jacket—

$\frac{7}{8}$ths cut-off	417
$\frac{2}{3}$ds cut-off	515
$\frac{1}{2}$ cut-off	511
$\frac{1}{4}$th cut-off	434

Pounds of steam discharged from steam pipe and valve chest—

$\frac{7}{8}$ths cut-off	327
$\frac{2}{3}$ds cut-off	422
$\frac{1}{2}$ cut-off	459
$\frac{1}{4}$th cut-off	500

Pounds of steam in cylinder at end of stroke—

$\frac{7}{8}$ths cut-off	13,144
$\frac{2}{3}$ds cut-off	10,742
$\frac{1}{2}$ cut-off	10,710
$\frac{1}{4}$th cut-off	8,536

Percentum of steam condensed in cylinder—

$\frac{7}{8}$ths cut-off	11·3
$\frac{2}{3}$ds cut-off	11·3
$\frac{1}{2}$ cut-off	7·9
$\frac{1}{4}$th cut-off	9·7

MISCELLANEOUS SUMMARY.

AZELEINE is a splendid red color, and is difficult to make. It is prepared as follows:—Ten parts of aniline are heated on a water bath up to 260 deg. Fah.; when this temperature is reached, seven parts of nitrate of mercury, dry and in powder, are dropped in by degrees. It must remain at 260 deg. for eight or nine hours, when the mass will be found to have changed to a beautiful red color. This only requires to be dissolved in achohol and water, and used for dyeing. When ribbons have been dyed with these and other colors, a beautiful gloss is imparted to them by the application of albumen in the form of white of an egg. Recently these purple and red dyes have been used as inks, but they are not so permament as those obtained from carmine.

VALUABLE "SECRETS."—The unpleasant odor produced by perspiration is frequently the source of vexation to persons who are subject to it. Nothing is simpler than to remove this odor much more effectually than by the application of such costly unguents and perfumes as are in use. It is only necessary to procure some of the compound spirits of ammonia, and place about two table-spoonsful in a basin of water. Washing the face, hands, and arms with this leaves the skin as clean, sweet, and fresh as one could wish. The wash is perfectly harmless, and very cheap. It is recommended on the authority of an experienced physician.

COAL OIL FOR WOUNDS.—An assistant surgeon, writing from Gettysburg, says that what water is to a wound in an inflamed state, coal oil is in a suppurating state—it dispels flies, expels vermin, sweetens the wound, and promotes a healthy granulation. He states that he has seen two patients whose wounds have been dressed with it, sleep before he was through with the third. This is a remedy easily applied in our hospitals. If it serves to keep away flies, it will add materially to the comfort of the wounded as well as their cure.

WHAT THE REBEL PIRATES HAVE DONE.—The two rebel pirates, the *Alabama* and *Florida*, with their tenders, have succeeded in reducing our commercial marine nearly three-quarters within three years. In 1860 the total tunnage of the United States, exclusive of whaling and steam tunnage, was 5,219,181 tuns. In 1864 it is in the neighborhood of 1,674,516 tuns; that is, we have lost in four years, 3,544,665 tuns—not of course by captures alone, but by the transfer of American vessels to foreign flags.

FAT.—In most families many members are not fond of fat; servants seldom like it, consequently there is frequently much wasted; to avoid which, take off bits of suet fat from beefsteaks, etc., previous to cooking; they can be used for puddings. With good management there need not be any waste in any shape or form.—*Exchange.*

[It is quite as well to keep it for soap-fat. Let every one make their own soap; they will put fat to much better use than making puddings with it.—EDS.

THE Lewiston *Journal* learns that the work on the new woolen mills in Lisbon is progressing favorably. The foundation of the mill at Little River, which is to be built of brick, is already laid; the coffer-dam is built across the Androscoggin, and work on the new dam is being prosecuted. The work on the mill at Sabattus stream is also going on, and a boarding-house is being put up. It is contemplated to have both mills running by autumn.

COVERED MANURES.—A late number of the *Journal of Agriculture* contains a statement of the result of an experiment made to determine the relative value of manure made under cover, and that exposed in the barnyard. Both manures were applied to potatoes in equal quantities. The yield on equal portions of land was as follows; manure from barnyard, 252 bushels per acre; manure made under cover, 297 bushels per acre.

MECHANICS' INSTITUTE IN ROXBURY.—We are informed by Mr. Thomas Taylor, of Roxbury, Mass., that the Mechanics' Institute in that place has a hall that will hold 1,500 persons, and that it is filled to listen to the lectures which are delivered there. There ought to be some one in every place where a hundred mechanics live to get up a similar association. There is no other enjoyment so satisfactory as intellectual enjoyment.

"IT is an ill wind that blows nobody good.' Humphrey's *Journal of Photography* says a call for more troops always makes the photographer's business "lively." "The fact that each one of our braves, before offering up his life on the altar of his country, has his picture taken, makes business for the operator, the stock dealer, and all others connected with them."

POWDER-MAKING IN CALIFORNIA.—The Los Angeles *Star*, of June 18th, says:—"The schooner *Alfred Adams*, which arrived at San Francisco on the 5th, from Santa Cruz, brought 1,200 kegs of California powder, the first considerable shipment from the new mill in the San Lorenzo Valley."

A LARGE establishment at Chicago, Ill., is devoted to the preparation of fertilizing material, by drying the blood livers and other waste from the slaughter houses. The product is sent to New York and Philadelphia for sale.

FIRES IN THE WOODS.—Our exchanges throughout New England and New York give accounts of extensive fires in the woods. In Canada the burning of the forests seems to be more general still.

PEARSALL'S box-setter for wagon wheels was patented by G. F. Pearsall, on Sept. 30th, 1862, not by T. G. Pearsall, in 1860, as published in connection with the engraving.

TO CLEAN A HAIR BRUSH.—Put a tablespoonful of spirits of hartshorn (aquia ammonia) in a pint of water, and wash the brush in it. It will very quickly make the brush clean as new; we have tried it.

AN engineer on an English steamer who was recently found guilty of breaking open a case of wine on board, and stealing several bottles, was found guilty, and sentenced to twelve week's imprisonment at hard labor.

Accidents at Ship Launches.

A ship which was lately launched in England ran off the ways just as a vessel was passing the point. The launch struck the vessel under way, stern first, and inflicted severe injuries upon her. It is but a short time since a large steamship was launched from an up-town yard just as the *Sylvan Shore*, a passenger steamer heavily laden, came up. Had it not been for the strenuous exertions of several individuals; ourselves among them, a sad disaster would have inevitably occurred. Much greater care than is generally exercised is needed at ship launches.

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Correspondence

Rifle Shooting--Off-hand.

Messrs. Editors:—In your paper of the 30th inst., is a short article on rifle shooting, which naturally interests me, and on which I will make a few remarks. It is true as you say that most of our country boys are more or less familiar with the use of fire-arms, though your remarks would have applied better to New England thirty years ago than to-day. But there are very few of them who have any scientific knowledge of the principles of the rifle, and you can scarcely find a man whose practice of long range shooting has been such as would render him efficient in actual service. It is true again as you say that our range for turkey shooting has increased from one to four hundred yards, but how is the shooting done? With a dead rest, a rifle too heavy for any man to carry, and provided with a patent muzzle and telescope sight, neither of which are admissible except on rare occasions for field service. In rifle-pits, and for picking off artillery-men through embrasures, such guns are of incalculable value, but no man who is familiar with the subject would ever dream of any but a very limited use for them in military service, or that men were fitted for active service by practising with such unwieldy implements. What we want is men trained to off-hand shooting at long ranges, and this we do not possess. It is easy to boast of ourselves and to sneer at our neighbors, but we do but make ourselves contemptible and show our own ignorance; and I assure you if we ever have trouble with England, we shall find such a body of riflemen in Canada as we cannot match for efficient field service. Every town there has its target ground and its rifle club, who practice regularly in the only way which can make true riflemen of them; that is at off-hand shooting and without any aids or appliances other than they would have in actual service.

I attended one of their rifle matches a few weeks since at which over $1,100 was awarded in premiums. Several hundred men were collected and the shooting lasted for four days at various ranges, from three to eight hundred yards. At the long ranges any position was allowed, but no other rest than could be obtained by the elbow on the knee, or on the ground it lying down. The bull's eye at 800 yards was three feet square, and one man made four bull's eyes out of five shots, and the fifth was but just outside of it. Now I know very well that with our heavy target rifles with patent muzzles and telescope sights, we could do much nicer work than that, but I know also that the men are very hard to find among us who have ever even tried to shoot off-hand at such a range; and moreover, setting aside the target rifles which are too clumsy for field service, we have no guns which are reliable at such ranges. There are no better sporting rifles in the world than ours up to the limit of their reliable range, but it is impossible on our principle of construction of both rifle and projectile to attain a very long range without making the gun too heavy for field service.

Our gunsmiths have not yet adopted the principle which Whitworth and many others have proved beyond all question, that to secure precision at a very long range without giving such weight to the gun as to admit the use of an enormous charge of powder, it is necessary to use a bullet of great length in proportion to its diameter, thus securing the momentum of great weight with comparatively little atmospheric resistance. The only guns at the match alluded to, which were reliable beyond 500 yards were of about $\frac{44}{100}$ caliber, using bullets an inch and a half in length, weighing over 500 grains and requiring a very sharp twist to keep them point foremost. I have frequently shown such bullets to our gunsmiths and find they invariably scout at them on account of the enormous friction of so long a bearing and so sharp a twist as they require to keep them in the right position, but they lose sight of the fact, which experience has proved to be true, that the increased momentum of their great weight, and the diminished atmospheric resistance of their small proportionate diameter is more than enough to counterbalance the additional friction. The rifle with which the four bulls' eyes at 800 yards were made, was manufactured by Marston of Toronto, a man who is perfectly familiar with our guns and has worked in our shops. I found the keenest interest in the subject pervading all classes of people, and was earnestly urged to visit various sections and witness their performances, but had time to accept only one invitation. I found there a permanent range, with an iron target, and butts to shoot from at different ranges, and a club of 100 men of all classes—merchants, professional men, and mechanics—who regularly close their places of business every Saturday afternoon and devote the time to rifle practice. You are more fortunate than I am if you have been able to find any considerable body of men in our country who are capable of doing such work as I witnessed while there, though I have long been familiar with rifle shooting East and West, and for three years past have paid special attention to the subject, from having been painfully impressed at an early stage of our present struggle, with our deficiency.

H. W. S. Cleveland.

Danvers, Mass., Aug. 1, 1864.

Preserved Meats.

Messrs. Editors:—Fruit cans, with tops which screw down upon india-rubber rings, so as to be air-tight, are common enough in the North. If one of these cans were filled say three-fourths full of fresh meat, the cover securely fixed, and the can then be put into boiling water for an hour or more, would the meat so treated keep untainted in this climate and in the field for three or four weeks? In campaigning there seems to be no resource for the officers but in buying, at exorbitant rates, the preserved fruits and meats sold by army sutlers. But I believe that they may put up their own, and that the cans may do the same duty an indefinite number of times. Also they will be more convenient in the field; for instead of having to cut open a can and then being obliged to eat up or waste its contents, one could unscrew the cover from the can chosen, and then replace it for another meal. And the empty cans would make splendid "Digesters" for field use. Put coffee and water in one, put on the cover, and put the can in a dish of boiling water, in another your materials for soup—could there be a handier or better way of cooking? Please reply through the columns of your valuable paper, and oblige a constant reader and subscriber. W. B. Guernsey, Lt.-Col., 26th U. S. C.

Beaufort, S. C., July 22d, 1864.

[The process of preserving meat is not an intricate one, but it requires experience, which every one cannot obtain. You could not unscrew a can of preserved meat, use a portion, and put the rest aside, for the act of opening would admit air. Cans of preserved meat should be made smaller, that is the only remedy, and the hungry individual could eat one, two, or ten cans, as his appetite demanded.—Eds.

The Hecker and Waterman Engine.

Messrs. Editors:—Can you give in your next number the dimensions of the slide valve in Hecker and Waterman's experiments, also the size of port, period of compression and of exhaust, at each point of cut-off? If the valve is worked with an ordinary eccentric the port must be very small at one-fourth cut-off. These dimensions are important in order to estimate correctly the value of the experiments.

Edward Brown.

Philadelphia, Pa., July 26, 1864.

[The cylinder is 10 inches in diameter, stroke 24 inches. Total space filled with steam, up stroke 1914·612 cubic inches, down stroke 1885·287 cubic inches. Steam port 5·125×1 inch; length of port from valve face to piston 3·5; making 17·937 cubic inches. Clearance of piston 79×.25=19·75. Slide valve worked by eccentric, lap three-fourths of an inch, cushions five forty-eighths of the stroke. Cut-off valve on the back of main valve, worked by eccentric, and made variable by right-and-left-hand screw. Fan, 12 feet five-eighths of an inch in diameter, length 11 feet 1⅝ths of an inch. Four wings, each 3 feet 1½ inches. Wheel on fan shaft 29 teeth, on main shaft 46 teeth. Boiler, heating surface, tubes 188 feet, fire-box 63 feet, total 251 feet. Grate surface 7·212 feet. Steam space 100 cubic feet —Eds.

A Grateful Inventor.

Messrs. Munn & Co., New York:—Gentlemen, no one could feel more indebted than I do to you for the many successes I have had through your Agency in preparing specifications and drawings, and presenting them to the Patent Office, and the speedy success of obtaining my patents. I can only assure you that you have my sincere wish that your labors may be doubly rewarded. I remain your well-wisher.

Wm. A. Jordan.

New Orleans, La., June 12, 1864.

The Blowing-up of the "Commodore Jones."--Letter from Capt. Wade.

Messrs. Editors:—I am aware that your journal is devoted to scientific purposes and not to controversy; but you will please allow me to correct a mistake of your James River correspondent, published by you on page 21, current volume of the Scientific American, where he says the *Commodore Jones* lay five minutes over a torpedo, of which Capt. Wade knew the exact position. Capt. Wade did not know the exact position, he only knew of its proximity, and the *Commodore Jones* was compelled by circumstances to cross the river, and was heading five points down the river, and going at the rate of ten knots at the time of the explosion.

Thos. F. Wade, U.S.N.

Wayland, Mass., July 25, 1864.

PHOTOGRAPHIC ITEMS.

In *Humphrey's Journal* for July we find an interesting article upon the "Esthetics of Photography," in which we find the following practically useful observations:—

"Certain rules are recognized as to the size of the portrait; the full-length portrait, as its name implies, comprehends the whole figure; the three-fourths portrait, taken seated, exhibits the figure as far as just below the knees; the half portrait contains the complete trunk and exhibits the whole of the arms; the quarter portrait retains the head, shoulders, and arms as far as the elbow; whilst the bust is limited by the commencement of the shoulders and thorax. In vignettes the head and part of the neck alone are presented in the picture, or they may merge into the quarter portrait.

"Of all these different forms, the full-length figure gives the greatest satisfaction, because it reproduces all that can be shown; next to this, it is our opinion, that the bust is most pleasing, because it presents to our view the complete features and neck without any parts apparently unfinished, from the fact that they are not commenced.

"It is the aim of the artist that his portrait shall excite no desire in the beholder to see more of the party than that which is already depicted, but, on the contrary, to make him satisfied and gratified with what he sees.

"If, now, the bust comprehends a part of the upper arm nearly as far as the elbow, the operator at once oversteps the rules of taste, because the portrait has the appearance as if a wrathy general had cut off all below with a sharp-edged sword—there is apparently something wanting; we are not satisfied with the production; and we cannot always define the cause of this want of satisfaction. The defect is to be attributed to an excess of figure depicted or to the incompleteness of the parts commenced. Remove the stumps of the arms, or exhibit the complete upper extremities in order to remedy the unpleasantness of the effect.

"For the same reasons the half portrait and three-quarter portrait excite sensations of dissatisfaction if the stumps of the thighs or legs are presented bisected in the middle.

"Thus it is that the portraits between that of the full-length figure and of the bust are all more or less unpleasing, because they exhibit incomplete parts. To remedy such defects, or, at least, to aid in removing the unpleasant sensations that would arise, the artist tries to obscure such unfinished parts by throwing around them folds of drapery or by the adaptation of other accessories appropriate to the case.

"The principal point, that is, the salient point for the operator to remember amongst the defects of portraiture just alluded to, is, when generalized, the want of completion in some part or limb commenced. The remedy is easily deduced from what has preceded."

The specific gravity of pure iron is 7·70, of aluminum 2.67.

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New Style of Turret Ship in France.

La Gironde, of Bordeaux, gives the following description of a new vessel now being built by the French navy at that place: —

"This plated vessel is not a heavy floating battery, such as the *Paixhans, Palestro, Peiho* or *Saigon;* nor does it resemble those ships now so well known in in France and England, *La Gloire*, the *Magenta*, the *Warrior*, or the *Resistance;* neither is it like one of those low-lying American monitors, so easily swallowed up in the sea. The ram-battery, the *Sphinx*, has the following dimensions:—Her length is 52 meters; breadth, 10 meters; depth of hold, 5 meters 20; height of battery 2 meters 30; and she draws 4 meters 40. The ship from the deck as far as 1 meter 80 below the water-line is armed with plates from 4 to 5 inches thick, according to the position of her curves. The bow, which dips at a very sharp angle, is armed with a powerful spur of cast steel, which is attached to a plating, but whose salient point is placed one meter lower than the point to which the plating descends. This position is given to her spur in order that she may strike other plated vessels in their vital parts beneath their line of defense.

The deck, which is it itself plated with sheets of iron placed between the beams and the planking, is surmounted by two plated towers, which present a formidable means of resistance.

In the fore tower will be placed a pivot gun of the enormous caliber of 300 pounds, destined to produce at short range the most terrible effects, and, in fact, capable of destroying any iron plating. In the tower aft will be placed two long range pivot guns of 70, for fighting at a greater distance. The principle of this armament is to replace by a small number of heavy pieces the ordinary armament, whose force has hitherto been judged by the number of guns of much less formidable caliber.

The cuirass of the *Sphinx*, which would laugh at projectiles of 30 pounds, has nothing to fear from a broadside of pieces of that caliber, whilst no vessel could possibly resist her 300-pounder.

The naval news from Cherbourg is that the *Solferino* is under orders for Tunis, where she will fly the Vice-Admiral's pennant; and the *Gen. Lee* has been directed by the Federal Government to repair to the Channel about the 15th inst. This ship is supposed to be of the Flying Dutchman class. If there is a *General Lee* at sea it is hardly the one defending Richmond.

It is felt that France has acted in deference to the North in not allowing certain craft, built on Confederate account, to leave her harbors. This decision could hardly have been taken on account of the transatlantic war still continuing, since the same vessel was sold, without any difficulty being made, to another belligerent power—Prussia.

Important Experiments at Shoeburyness.

The *Mechanics' Magazine* continues its account of the Shoeburyness experiments as follows: —

"Perhaps the most important firing and progress at Shoeburyness ever yet recorded, took place on Monday and Wednesday last. The question to be decided was no less than the continuance or the abandonment of the construction of the Spithead forts. The whole problem lay in the amount of damage which a heavy gun can inflict at a range of say 4,000 yards. In order to ascertain this, it is by no means necessary that such a range should actually be employed; a little calculation is sufficient to prove that a gun, the service charge of which is 90 lbs. of powder, and the initial velocity of the projectiles of which is 1,200 feet per second, will, when the initial velocity is reduced to 860 feet per second by a charge of 40 lbs. of powder, give the equivalent result to firing at 4,000 yards, by merely firing at 200 yards. Accordingly, the six hundred-pounder has been fired with 40 lbs. to ascertain what the execution of that gun would be at 4,000 yards, when fired with 90 lbs. of powder. The execution was terrible; much more so than when the same gun was fired at the same range with 900 lbs. of powder. Both shots will very likely long remain on the same target, so that what we are here stating admits of very easy verification. The target fired at was the box oak one faced with Messrs. J. Brown & Co's 6½-inch-plates, and the point of impact was the top or deck part, so that behind the 6½-inch armor plate there were little less than three yards of solid oak and old iron target. The shot struck the armor-plate, went through it, throwing an armor-plate fragment of 2 cwt. a distance twenty-five yards, together with a perfect shower of massive oak fragments. Nor was that the whole damage. On inspection it was found that the woodwork was very much crushed in. On the spot, among the scientific men and officers present, there was but one opinion, and that was, that the strongest iron-clad that would swim could be smashed to atoms by the six hundred-pounder gun at 4,000 yards. On the spot it was also stated that the Americans had not been able to fire more than 40 lbs. of cake powder in their six hundred-pounder gun, and that one of them had burst with that charge. Cake powder possesses 15 per cent less strength than our powder.

"It is hardly necessary that we should add one word to this just now; the facts speak for themselves."

[In regard to the American guns, there was an illustration on page 324, Vol. IX. of the SCIENTIFIC AMERICAN, of a thirteen-inch gun cast at Providence, R. I., which was fired 178 times, with 50-lbs. charges of powder and solid shot weighing 276 lbs. each. We have no six hundred-lb. gun. The solid shot for the fifteen-inch weighs 428 lbs. and for the twenty-inch 1,000 lbs.; but these guns are not designed for solid shot.—EDS.

Wages of French Mechanics.

An Englishman, Mr. B. Barry, has recently visited the French dockyards, having unusual facilities furnished him, and has published a book, full of praise of everything that he saw, with the exception of Government manufacturing, and the condition of mechanics and laborers. He thinks that the French operative is not as well off as the English.

In the first place, pay-day comes but once a-month, and therefore the credit system with all its evils reigns paramount. Wages are calculated on a scale which barely allows for subsistence, certainly not for comfort; a fitter can earn from 4 to 7 francs daily (seventy-six cents to $1 33); a laborer from 1½ to 3 francs (fifty to sixty cents). The married man in Havre, with 3 francs a-day, who has one or two children, is in a condition the most miserable. Single and married the men are in penury. The iron heel, too, of the master grinds the man. Strikes are summarily put an end to by the imprisonment of the "turn-outs." Before French labor can be hired at all, the laborer must produce a book issued by the mayor or authorities of the town wherein he was born, and in this book is written the history of his life. Without this there can be neither hiring nor servitude. Above all this comes the conscription, by which any man may be snatched away in a moment for service in the army or in Government dockyards. The tardy development, of what we may term the results of skilled labor, in France, is not surprising under such circumstances or conditions.

Curious Way of testing the Safety of Liquor Packages.

Charles Dickens, in an account of the United Vineyard Proprietors' premises, gives the following example of the manner in which the superintendents test the liability of breaking the bottles on their way to market:—

"The next process is that of packing, and this is now done in boxes or cases, principally of one dozen bottles each. Some art as well as much care is required in this operation, and the energetic manager somewhat surprised us by his method of testing the efficiency of packing. We accompanied him several mornings in his survey of the various operations; and upon the first occasion, when he entered the department where the packers were engaged, we were amused by observing him take from the floor a case of brandy which a workman had just packed, but we were more astounded than amused to see him suddenly dash the case with some vehemence upon the floor. He was angry at the result, for the leakage told that some of the bottles were broken, which we confess did not surprise us, seeing, as we did, the violence of the fall. The workmen looked concerned; the foreman humbly submitted that the force used in throwing the case down was greater than any likely to occur in a natural fall, and exemplified it in his way by toppling over about a dozen cases that were placed upon each other, and out of the whole lot not a single fracture took place. But our manager was not satisfied; he would have them re-packed, that they should stand his test. The following morning he again tried the same experiment, and again more breakages took place. He threatened that if on the following day the same result occurred, all engaged in the packing department should be dismissed. We felt for the poor, anxious-looking men, and with some concern attended our energetic friend upon his third trial. He went to work as vigorously as ever; after several attempts he failed in smashing a single bottle, so that his threatenings led after all to a satisfactory improvement."

The "Mudsills" in the South.

The Chattanooga *Gazette* thus discourses of the effects of Northern industry in that city:—"The 'mudsills of society' make themselves felt in a great many ways, but in none more than in the grand and lasting effects produced by mechanical agency and skill. A liberal sprinkling of 'greasy mechanics,' in any particular locality, will not be found to detract much from the respectability of the place, except very absurd notions on the question of social ethics prevail. The most high-toned and chivalrous Southern fire-eater would not object to the changes, in the way of public improvements, going on at present in this place; all brought about by the 'hated Yankees.' In the large inclosure connected with the railroad depots the authorities are erecting several substantial and extensive buildings to be used as repair-shops and engine-houses, and which will, very likely, be of vast utility long after the war is over and the rebellion wiped out. We shouldn't wonder if the war should develop more energy and enterprise (imported) in the South than she has ever known in her palmiest days."

The "Scientific American" in the Army.

An attentive and patriotic correspondent in the 104th Ohio Volunteers, now at Chattahooche river, writes to us complaining that the *Louisville Journal* appropriates our editorials and palms them off as its own. This is very good evidence of the appreciation our paper is held in. Mr. Prentice probably thinks our articles are as good as his, and therefore tries to make his readers think he writes what he copies. We are sorry we cannot return the compliment. We shall neither copy his "wit" in the *Ledger*, nor his political sentiments.

Our correspondent also says:—"The SCIENTIFIC AMERICAN reaches me here as regularly as the mail comes. I do not think there has a number missed since the first of April, when I commenced taking it here." Good testimony as to the faithfulness of "Uncle Sam's" mail-carriers.

Pump Propulsion for Boats.

About once a year some indefatigable person endeavors to make a boat go by driving a current of water out of the stern or by the side so that it strikes against the water, or meets with atmospheric resistance. Dr. Franklin proposed this in 1745, and it has been tried on a large scale on the Scheldt River, in Holland; in this place two turbines are employed to force the water out. Another plan was tried in this city with one of Lee & Larned's steam fire-engines and Carey's rotary pump. We saw this vessel go out and it certainly moved, for we watched it pass a dock spile. We believe a "yacht" is now building in this city of a hundred tuns burthen, to try this "principle" once more.

THE dangers arising from the universal adoption of the common lucifer match have induced chemists to seek a substitute for it. M. Peitzer has recently proposed a compound which is obtained in the shape of a violet powder, by mixing together equal volumes of solutions of sulphate of copper, one of which is supersaturated with ammonia, and the other with hyposulphite of soda. A mixture of chlorite of potash and the above powder will catch fire by percussion or rubbing; it burns like gunpowder leaving a black residue. M. Viederhold proposes a mixture of hyposulphite of lead or baryta, or chlorate of potash for matches without phosphorus. The only inconvenience of this compound is that it attracts moisture too easily.

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Improved Steam Engine.

The peculiarity of this steam engine is the application of the valve stem to the shaft, thus doing away with the eccentrics and their disadvantages. A glance at the engraving below will convince the mechanic that this engine is most simple in its construction, and has many advantages over the common slide valve engine. Fig. 1 represents an elevation of a working model, and although in the construction of a large engine there would be changes in the details, it suffices to show the principle of the improvement. A is the main shaft, and B the valve stem, which is rotated with the main shaft in its revolution. C is the steam chest of circular form; D is the coupling which acts on the valve and by which the engine is reversed. E is a universal fork joint, which is necessary to give the double movement to the connecting rod. Fig. 2 shows the bottom or face of the valve, of which A is a concave chamber and B the face. C is a port cut through the valve, which allows the steam to enter the induction ports at the proper time. Fig. 3 is the valve seat in which A A are the induction and C the eduction ports. Fig. 4 is a top view of the valve of which A is the exhaust chamber; B the port, and C the orifice for the valve stem. Fig. 5 is a transverse section of the valve, its case, the valve seat, the induction and eduction ports of the steam chest and cylinder. A and B are the induction ports, and C the eduction port. E is the valve which, when rotating, covers the induction port alternately, and the eduction port constantly. D is the steam room of the steam-chest. F is the valve stem, which is acted upon and rotated by the main shaft by means of the coupling represented in Fig. 6, of which *a* is the shaft and B the valve stem. C is a cup which slides over the shaft, when the pin, F, is in the slot, D. If it is desired to reverse this engine, the cup, C, can be operated upon by the hand or a lever. By slipping the cup back on the valve stem and disconnecting the stem from the shaft, the engine is allowed to turn half round, when the cup will slip back, and the engine is reversed. The whole arrangement is very simple and has many advantages which the common engine has not. We do away with a great deal of friction and extra machinery. The valve which is used longest will have the best fit on its seat. There is no stop of valve, consequently no slack motion, which wears an engine extremely. A slide valve stops twice in one revolution of the engine; but this one has a smooth, even and continuous rotary movement. This valve is started and the slack motion, if any, is taken up when started, and there is no thumping of eccentrics, however high may be the pressure of steam used.

This engine is especially adapted to small propellers, as it is reversed with precision and with no complication of machinery. For rotary pumps it is well adapted, and its steadiness of motion will do away with a great deal of trouble heretofore experienced. The inventor has devised a very simple and effectual balance for this valve which can be applied without extra expense. For further particulars address the inventor, Henry T. Carter, Portland, Maine.

Fig. 1

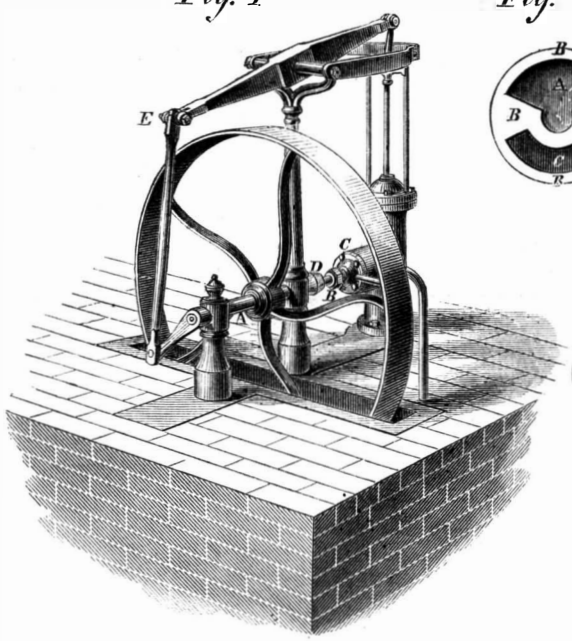


Fig. 2

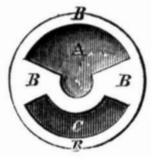


Fig. 3

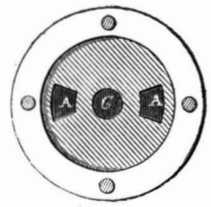


Fig. 4

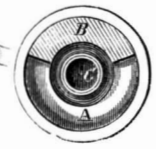


Fig. 5

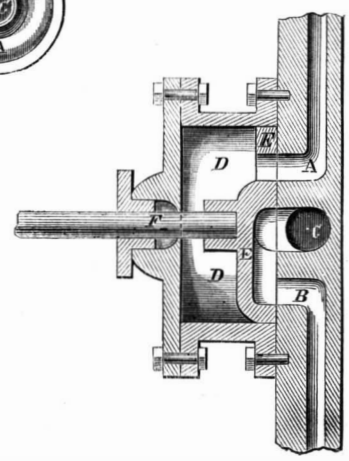


Fig. 6

Improved Trunk.

A strong serviceable and light trunk is a thing which is much desired. Too many of them, as now made, are mere shells, although outwardly they appear durable enough. With the reckless handling trunks get on railroads and steamboats, it would seem as if a cast-iron box would be smashed to pieces, and many a traveler mourns the loss of his effects from the sudden collapse of the trunk containing them.

The traveling case shown herewith is constructed on a good plan. It is made of strong materials well put together, and should last a life-time. The top is made of two or more barrel staves, A (Fig. 2), jointed together in the middle and steamed and compressed so that the edges, B, are rounded. The top has a swell in it which brings the rounded edges below the line of the top, so that they are not liable to be struck by placing other trunks on top. The upper part of the lower half of the trunk is bound with a stout iron frame, C, and in addition to this there are corner pieces, D, which are struck up out of a single piece of metal, so that they cannot split or give way. These corner pieces are a very great protection and strengthen the trunk materially. The frame, C, is chamfered on the upper edge, E, so that the top shuts down readily and without jamming. These features make this a strong and invaluable trunk to travelers, and we think it will be highly approved. It was patented on the 10th of May, 1864, through the Scientific American Patent Agency, by Henry T. Lee, of Jersey City. For further information address the patentee at Messrs. Frost & Lee's, 54 Montgomery street, Jersey City.

CARTER'S STEAM ENGINE.

Fig. 1

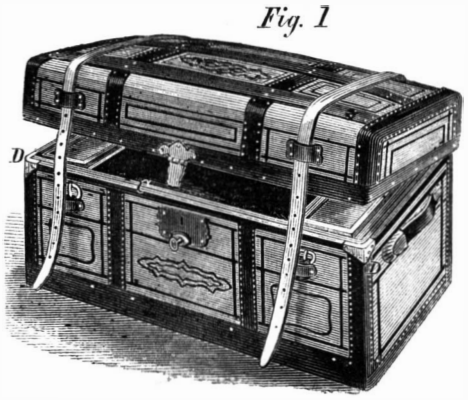
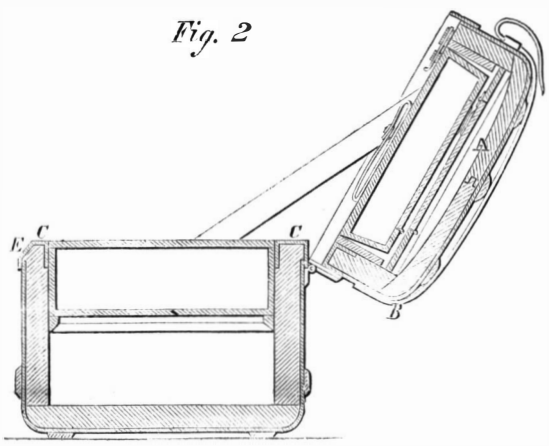


Fig. 2



LEE'S IMPROVED TRUNK.

Annealing of Steel.

In the annealing of steel the same care is required in the heating of it as there is in heating it for hardening, for over-heating the steel is as injurious in one case as in the other. In the process of annealing artists differ very much, some approving of heating the steel and burying it in lime, some of heating it and burying it in cast-iron borings; while others approve of heating it and burying it in saw-dust. A far better plan is to put the steel into a box, made for the purpose, and fill it with charcoal dust, and plug the ends up so that the air is kept from the steel, then to put the box and its contents into the fire, till it is heated thoroughly through, and the steel is at a low red heat; it must then be taken from the fire, and allowed to remain in the box without opening the box till the steel is cold. Then when taken out the steel will be nice and clean and very soft, and without those bright spots which some mechanics call pins, and which are no small impediments to the filing and working of steel, and if any difference, the steel is improved by the process. A piece of stout gas pipe, with a bottom welded in, and a plug made for the other end, makes a very good box for a small quantity of steel; but, for a large quantity, the box must be large in proportion. If the steel is very large it is as well to make a charcoal fire to heat it in, and then let the steel and the fire get cold together before it is taken out, and it will be equally soft. But it sometimes happens that a piece of steel is wanted in a hurry, and the steel, perhaps, is too hard to work on, and cannot wait for its being softened in a box; in such cases it may be heated in an open fire, and buried in charcoal dust till it is cold, or if it be heated to a red heat sufficient to be seen in a dark place, and then plunged into cold water, it will work more pleasantly; but not so soft as if it were heated in a box with charcoal. There are many that do not know the value of a good tool, because the steel they work on has never been properly annealed, and before the tool has half done its duty it is worn out, or wants repairing: whereas, if the steel had been properly annealed, the same tool might have lasted ten times as long without repairing.—*George Ede.*

The *Kennebec Journal* says grass-cutting machines and horse rakes have come into very genera use in Maine this season. The use of these improved implements has had an effect in lessening the quantity of division fences, and many farmers have found out that there is no real profit in feeding down their mowing fields

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THE

Scientific American.

MUNN & COMPANY, Editors & Proprietors.

PUBLISHED WEEKLY AT

NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

☞ "The American News Company," agents, 121 Nassau street, New York.

☞ Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill London, England, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent to them will be promptly attended to.

VOL. XI. NO. 7....[NEW SERIES.]....*Twentieth Year.*

NEW YORK, SATURDAY, AUGUST 13, 1864.

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THE PRODUCTS OF COMBUSTION FOR MOTIVE POWER.

When fuel is burned in the furnace of a steam engine, there is a small proportion of solid matter left in the form of ashes, and the remainder is converted into elastic gases, which pass off at a high temperature into the smoke-stack. As these gases in being heated expand in the same way as the steam, they exert mechanical force, and many efforts have been made to use this force in driving machinery. The effort has not been successful in the case of the steam engine, though it has in that of the air engine.

A few years since a steamboat was run a few trips on the North river by an engine in which the gases from the furnace were driven into the cylinder; the furnace being, of course, air-tight, and the air being forced in by an air pump. It was said that great economy was obtained, but the ashes and bits of coal driven into the cylinder scratched the inner surface of the cylinder and the packing so much as to render the plan impracticable. The method was then tried of driving the gases through the boiler, in order that the ashes and unburned coal might be retained by the water. This saved the cylinder, but soon filled the boiler with ashes, and the scheme was abandoned. In Roper's air engine, illustrated on page 97, Vol. VIII. of the SCIENTIFIC AMERICAN, the products of combustion are worked through the cylinder, and an experience of some two years with a considerable number of engines seems to indicate a complete triumph over all mechanical difficulties.

Roper's engine may be regarded as simply a steam engine woked with air, all of its parts being equivalents of corresponding parts in the steam engine. The air is forced by an air-pump into an air-tight chamber where it is heated, and it is then admitted by a valve into a cylinder to drive a piston. This plan of an air engine was suggested several years ago at the Polytechnic Association in this city by Professor Seely, and it was recently described by Mr. Fairbairn, of England, as Joule's air engine of constant pressure. The mechanical arrangements, however, which have made it a practical machine are due to the inventor of Roper's engine. Prof. Seely proposed to use the products of combustion, but did not suppose that this could be done in a cylinder if anthracite coal was employed as fuel, and he expected to employ petroleum.

In Roper's engine the coal is placed in an open furnace inclosed in the air-tight chamber in which the air is heated. The air is forced into this chamber in two streams, a small one under the grate and a large one above, so that only a small portion of the air passes through the fire; thus avoiding a blast which would carry along ashes and unburned coal into the cylinder. The cylinder is upright, the packing is at the upper part of the piston, and the piston is elongated downward in the form of a hollow drum a little smaller than the cylinder, so that it is surrounded by an annular space, filled with air or gas, which is sufficiently confined to keep the ashes away from the packing. Leather is used for packing and lasts a long time.

The practicability of utilizing the products of combustion in the air engine having been thus experimentally demonstrated, the efforts of inventors will doubtless be again directed to the application of this improvement to the steam engine. A calculation, therefore, of the possible gain by such an improvement will be of interest at the present time.

When anthracite coal is employed as the fuel, the calculation is exceedingly simple, for the combustible portion of anthracite is so nearly pure curbon that it is sufficiently accurate for this inquiry to regard it as carbon.

Atmospheric air which is drawn or driven into furnaces to burn the fuel is composed of scarcely variable proportions of oxygen and nitrogen, with small quantities of carbonic acid and the vapor of water. According to Booth, the following may be considered as the average proportion of these substances by weight:—

Oxygen	22.76
Nitrogen	76.15
Vapor of water	1.03
Carbonic acid	0.06
	100.00

It will be seen that the aqueous vapor and carbonic acid are in quantities so small that they may be omitted from this estimate. If just the proper quantity of atmospheric air is introduced into the furnace to burn the coal, and if the combustion is complete, its oxygen will all combine with the carbon of the coal to form carbonic acid, and the nitrogen will remain uncombined. There will, therefore, be two gases to be expanded by the heat, carbonic acid and nitrogen.

In the Hecker and Waterman experiments, in working the engine as a non-condenser, $2\frac{1}{2}$ pounds of combustible per hour were consumed in generating a horse-power. To burn this quantity of carbon into carbonic acid would require $6\frac{2}{3}$ pounds of oxygen, and if this quantity were introduced in its mixture with nitrogen in the atmosphere, it would carry along with it 22·6 pounds of nitrogen. The 2·5 pounds of carbon combining with the 6·67 pounds of oxygen would form 9·17 pounds of carbonic acid. In the production of one horse-power per hour we, therefore, have 22·6 pounds of nitrogen and 9·17 pounds of carbonic acid.

Carbonic acid is once and a half times heavier than atmospheric air, and air at 32° is 770 times lighter than water. As water weighs $62\frac{1}{2}$ lbs. to the cubic foot, a cubic foot of air weighs 0.0812 lbs. and a cubic foot of carbonic acid 0.1218 lbs.=8.21 feet to the pound, and 75·29 cubic feet to 9.17 pounds.

The specific gravity of nitrogen is ·972=12.7 cubic feet to the pound, and 287 cubic feet to 22·6 pounds.

Thus if the air is introduced at 32° the quantity of the gas resulting from the combustion per horse-power per hour will be 362 cubic feet under the pressure of the atmosphere. If this is heated 493° its pressure will be doubled, giving a working pressure of one atmosphere. If this gas was worked through a cylinder of 1 foot area and 1 foot stroke it would give 362 strokes, lifting 15×144=2160 lbs. 1 foot at each stroke=781,920 foot-pounds in 362 strokes, or in an hour. This divided by 60 gives 13,032 foot-pounds per minute.

If, however, the air-pump worked throughout its stroke against the pressure in the air chamber, and if the heated gas in the working cylinder was not worked expansively, one half of this power would be consumed in forcing the air into the chamber. Consequently we should have but 6,516 foot-pounds per minute, an addition of 19·74 per cent to the horse-power produced by the steam.

An invention that would save 20 per cent of all the fuel burned in steam engines would be of immeasurable value. The most prominent obstacle to be overcome is the difficulty of introducing coal into an air tight chamber against pressure.

EXPERIMENTS WITH TOOLS NEEDED.

Theory is one thing and practice another, and sometimes it happens, very awkwardly, that the experience of the workshop refuses to agree with the laws philosophers lay down. Just at this time the interest in the economy of working steam is very great; whether it shall be used expansively or non-expansively for some purposes is still a mooted point, but the experiments now going forward will settle this vexed question, we hope, at once and forever.

There is another and a very important point in the economy of the workshop, which is the power required to drive tools. Let us know what is the best form for a roughing tool. Out of half a dozen turners but one will be found who has a tool that cuts at all, the rest merely grate or tickle the top of the metal, so that some few miserable raspings are taken off. That this is a manifest loss to the company or proprietor is evident, and proceeds solely from a want of knowledge of the right principles. To obtain the knowledge in question we must experiment, not guess, and we think that a series of trials with a view to ascertain the best form of edge for a roughing tool would not be time thrown away.

A good plan would be to take a small lathe and a train of gearing similar to those used for churn powers. Let a pulley be applied to this gearing and a belt from it directly to the lathe. A weight suspended from the drum of the gearing would represent the power. Now let a tool be put in the slide rest and set to work with a stated feed, speed, and depth of cut. The time required to run one inch, or more, should be accurately noted, and the tool removed and replaced by another. This in turn should be carefully watched and the result recorded. In this way the diamond-point, the round-nose, the side-tool, the "no kind of tool," would all find their appropriate places, and the results would show very satisfactorily, if the experiments were well conducted, how much power was required to cut one inch, with given feed and speed and depth of cut. Of course the same shaft should be used for all the tools to cut on. The conditions would not vary with larger cuts and heavier feed. Another point gained would be the knowledge of how much horse-power, expressed in foot-pounds by the fall of the weight in a given time, was required for a certain number of lathes of a known length of shears and swing. Roughing off work is the heaviest that is done on a lathe, if we except cutting screws of quick pitches, and the expression would be the maximum power required for a machine shop.

Much other interesting and valuable information might be obtained which does not now occur to us, for instance the loss of time and money through working with dull tools, or those that were too soft, etc., and we hope that some enterprising foreman or manufacturer will think it worth while to institute these experiments.

CLUMSY PACKING RINGS.

Nearly every observant engineer must have noticed how badly proportioned the packing rings of ordinary stationary engines are for their work. It is not at all uncommon to see the packing in cylinders as small as eleven inches in diameter, one and a quarter inches thick in the aggregate, or five-eighths thick for each ring. Some of them are even more than this. Such rings cannot be packed steam-tight without causing a great strain on the cylinder, which is injurious both to it and the springs. It is almost impossible to make springs stiff enough to stand the pressure they are subjected to, and set screws are therefore put in the springs to keep them up to their work. It is plain that this is one cause of the scratched cylinders and broken rings that we often see, for when packing is properly constructed it will last for years with very little repair. The stiffness of rings made on such heavy patterns is so great that they can hardly be sprung together by the force of a strong man's arm; for rendering a

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piston steam-tight they are virtually useless. In our largest ocean steamers, say those having 105-inch cylinders, the outside rings are not over three-fourths of an inch thick, and yet we meet with packing in small cylinders of very nearly the same dimensions. It would be far better to reduce the outside rings to three-eighths, and the inside ones to five-eighths in cylinders of 24 inches diameter, and from that to forty inches; below twenty-four inches they might be made even less with good results. The packing should be light and tough, not hard and stiff. It should be like the hoops of a barrel, and stay wherever the springs put it. With such rings little pressure would be required, and the engine would not only perform better but actually wear longer than where stiff, ungainly rings are employed, and jack-screws substituted for springs.

PHILOSOPHY IN A CUP OF TEA.

We were recently interested and somewhat amused at the conversation of two gentleman at a table before us in a restaurant. As their cups of tea were placed on the table, one of them remarked to the other:—

"I suppose, Doctor, you put the milk and sugar into your tea on philosophical principles?"

"Certainly," said the Doctor. "I have ascertained, not by syllogistic reasoning, but by direct observation of that particular property, that tea is spoiled if it gets cold, or even cool, and I consequently introduce the milk and sugar in a way to cool it as little as possible. Now, a cup of tea loses its heat in two ways, by evaporation and by radiation. It is well known that all bodies radiate heat, and that at a high temperature they radiate more heat than at a low temperature. Heat is streaming out from this cup of tea in every direction, and is absorbed by the walls of the room, at the same time heat is being emitted from the walls of the room, and is being absorbed by the cup of tea. But as the tea radiates more heat than it receives, it is constantly growing cooler. When its temperature has come down to that of the surrounding walls, it will cease to grow colder. The law on which I act is this: the rapidity of the cooling is proportioned to the difference between the temperature of the tea and that of the bodies by which it is surrounded; that is to say, when it is very hot, it loses heat more rapidly by radiation than after its temperature has been reduced. The same is the case with the cooling by evaporation. The steam that you see rising here, though no hotter than the water, has in fact absorbed 1,000° of heat, and that has come from the tea. This evaporation goes on most rapidly when the tea is hottest. Thus in both ways a hot cup of tea looses heat more rapidly than a cooler cup. If when it is boiling hot its temperature is reduced at the rate of a degree a minute, perhaps when it gets within two or three degrees of the temperature of surrounding objects, it may not be cooled at the rate of a degree in half an hour.

"If the milk and sugar are introduced when the tea is first brought, their cooling effect is applied to the cup in its hottest condition, and the reduction of temperature is checked; while if the rapid cooling is allowed to go on awhile first, and then the temperature is further reduced by the addition of the cold milk and sugar, the tea is made very cold, and its flavor is ruined. So, you see, when I put the milk and sugar into my tea as soon as it is brought, I do it on philosophical principles."

MR. JEROME'S YACHT.

On the 28th ultimo, in company with a select party of gentlemen, members of the New York Yacht Club, we enjoyed a pleasant sail on the splendid new steam wacht recently completed for Mr. L. W. Jerome, Esq., of this city.

THE YACHT.

This vessel is a somewhat famous one. She has been built for some time, but this trip was her first successful one since completion. She had originally a large shop engine of 16-inch cylinder and 36-inch stroke, which was adapted to her by a well-known patent-lawyer of this city. The yacht, however, disliked the adaptations, and stubbornly refused to go of long as the engine remained in her. Thereupon it was taken out, and new ones were substituted. The vessel has a most beautiful model for speed, the bow being long, symmetrical, and well up out of the water. The masts have a slight rake, and when running under full speed, with her high bow, she reminds one of a mettled racer. The hull was built by Messrs. Lawrence & Foulks, of Williamsburgh, and is 120 feet on the keel, and 130 on deck; the beam is 20 feet, and depth of hold 10 feet. The outside planking is 2½ inches thick, and it, as well as the frames, are of white oak. The whole is fastened in the best manner, no expense having been spared in its construction. The yacht is schooner-rigged, and when under sail alone did well.

THE ENGINES.

The steam-power consists of two inverted cylinders, 22 inches diameter by 22 inches stroke of piston, low pressure, and fitted with link motion. These engines are beautiful specimens of workmanship. They were built by the Novelty Iron Works, under the superintendence of Mr. I. V. Holmes, a rising engineer, and are as compact in size as they are efficient in action. The engine frame is made to serve as the condenser, and the air-pump gearing is so arranged that it balances the main moving parts very perfectly. At 96 revolutions, the highest attained on this trip, their action was remarkably smooth and regular. These little engines are much admired, by engineers who have examined them, for their good qualities. The screw is four-bladed, of iron, and has a diameter of 9 feet, and a pitch of 13 feet. At 96 revolutions, which is a low rate of speed, she would make 12 miles an hour, minus the slip. The engines, however, can run much faster, and have made 110 turns per minute without heating.

THE CABINS AND FIXTURES.

The cabin hatches and hatch combings, where they rise above deck, are of solid mahogany, strongly dovetailed together, and plainly but beautifully finished. Below, the luxurious fittings speak plainly of the tastes of the owner and those to whom he entrusted the task of furnishing his vessel. The panel work in the after cabin is white, picked out with gold, and striped with faint pink tints. Green velvet cushions along the lockers invite the weary mariner to repose, and the green silk rep curtains, lined with canary-colored satin, that fringe the berths above, cause him to be careful lest he soil them with rude handling. The carpets, the black walnut beaufet for silver, and the pantry adjoining, are all upon the same scale of elegance, and there is a dainty little wash-room aft, where the toilet can be made. There is also another cabin forward, which is handsomely furnished.

THE ARMAMENT.

Two guns form part of the equipment of this vessel, they are steel, 12-pound boat howitzers, of the Wiard pattern, and when mounted on their massive brass carriages and run forward, look sufficiently formidable to deter any evil disposed persons. The entire cost of the yacht was $100,000. The yacht was superintended throughout by Mr. W. W. Vanderbilt, C.E., of the Pacific Mail Steamship Company. Mr. Vanderbilt has shown great taste in the construction and appointments, and shines with renewed splendor in the eyes of his acquaintance since this his latest achievement. Mr. John Maguire, the venerable pilot, graced the occasion with himself and his famous white hat, and took the boat in and out with his usual skill. The trip was greatly enjoyed by all present, and the best wishes of the guests will attend the yacht *Clara Clarita* wherever she goes.

THE YEAR 1863.

Whoever ishes a complete record of the eventful year 1863, may find it, collected with great care and judgment, arranged in alphabetical order, printed in clear type, and bound in one large neat volume in the *American Annual Cyclopedia*, published by D. Appleton & Co., 443 and 445 Broadway, New York. It contains a complete history of the war during the year with numerous maps to illustrate all important operations, statements of the number and condition of the troops, North and South, lists of the officers, accounts of improvements in ordnance and iron-clad vessels, operations of the Navy, statistics of the crops, transactions of European nations, obituaries of officers and other prominent persons who died during the year, and, in short, forms a complete history of the year. What an invaluable work for reference a complete set of these annuals will form in any library, public or private!

Shrinking of Steel.

As a slight mistake at times is the common lot of all, a few words will not be out of place upon the shrinking of such pieces of work as the mechanic may have had the misfortune of boring too large, and which would be useless but for the process of shrinking it smaller. Shrinking is simply heating the steel and plunging it in cold water, but should it not prove small enough the first time, the operation must be repeated, and if insufficient the second time, it must be operated upon the third time, which generally effects the purpose. After the third time, I have generally found the hole to cast either oval or bell-mouthed, but after shrinking it the third time, and the article still remaining a waster, there is another source open, which is simply to heat it again, and dip it in the water half-way, leaving one-half of it above the water, and then to heat it again and dip in the reverse way, half-way in the water; this will often accomplish what other methods have failed to do. Small holes will shrink rather more if the hole be filled with loam; shrinking and expansion of steel vary so much, that I have, at a red heat, shrunk the hole in a steel ring considerably; and at a whitish heat on the same steel the hole has been considerably larger. Iron rings, or collars, may be shrunk after the same manner as steel, by simply heating and cooling in water.

Much might be said upon the various kinds of tools used in the turnery, but there is such a variety of them, differing in form and size according to the necessities, it would take a whole volume to do them justice; some turners are apt to think the tools of their invention best of any, and their attachment to them, not to say bigotry, is often accompanied with a silly attempt to conceal from their fellow-workmen the benefits of their amazing discoveries as to the best shape of a tool; but having had good experience in tools, and their different shapes, I give it as my opinion that the best shape of a tool is a tool that answers the purpose, does the work well, wherewith least steel is cut to waste in the dressing of it, least time required in the grinding of it, and whose wear is longest without repairing.—*George Ede.*

NEW BOOKS AND PUBLICATIONS.

DICTIONARY OF SOLUBILITIES. PART III.

We noticed some time since in terms of the highest praise, the first two parts of "Storer's Dictionary of the Solubilities of Chemical Substances," published by Sever & Francis, Cambridge, Mass., and we are pleased to know that our high opinion of the work is shared by the most learned chemists in the city. We are now in receipt of the third part, which completes the work. An examination of a few pages is sufficient to impress us with the enormous amount of labor expended in its compilation, and of the illimitable extent of the science of chemistry.

Corrugated Lining for Skating and other Boots.

Boots and shoes corrugated upon the *vamps* have become quite fashionable, but we never could see their utility, nor could we ever discover their beauty. They are admired, however, and are much worn. We have received from the inventor, what we consider both a sensible and highly useful improvement, viz: a Balmoral boot upper with corrugated lining. For skating boots this is an excellent invention; for no matter how tight the skate is strapped on, the air can ventilate around the foot, keeping it free from the perspiration that would ensue if there were no vent. Besides in wearing corrugated lined boots with rubber over-shoes, let the latter press ever so tight, still there will be free ventilation. We have no doubt these linings will meet with approval by manufacturers, as they certainly must by wearers.

DR. B. N. HARRIS'S large barn in Winslow was struck by lightning on the 11th of July. The lightning passed down the inside of the barn, but strange to say did not set fire to the hay lying against the posts it shivered. There was some stock in the barn which was not injured, but a hog forty feet from the barn was killed, though no mark was upon him.

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RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week ; the claims may be found in the official list:—

Roofing Shingles.—The ordinary shingles, or those now in common use, are constructed of wedge shape, being thickest at their buts and gradually tapering their whole length towards their opposite ends. These shingles are laid upon lath or roof boards and secured thereto by nails and arranged in layers, one layer lopping over the other, so that the roof, when completed, forms a series of inclined planes of greater or less length, according to the length of shingle exposed to the weather. Each shingle presents to the descending water passing over it two sides of a triangle, the perpendicular and the base; the perpendicular being the weather surface, technically so termed, and the base the butt of the shingle. In the case of shaved or rived shingles the grain of the wood corresponds nearly with the direction of the length of the shingle, which greatly facilitates the free passage of the water over it; but with sawed shingles the grain of the wood is most generally more or less oblique with the direction of the length of the shingle, which serves to retain the passage of the water over it and causes the latter to have a sluggish movement, and instead of falling directly off from the terminus of one inclined plane to the upper surface of the one immediately below, it passes down over the butts of the shingles across the grain of the wood, or endwise of the same. The water has thus every facility to penetrate the pores of the wood, inducing decay and favoring the growth of moss. This invention consists in constructing the shingles in beveled or taper form, so that they may be laid with an uniform smooth exterior surface, and the roof at each side or pitch be a continuous inclined plane, or nearly so. T. H. Squire, of Elmira, N. Y., is the inventor of this improvement.

Feed Wheel for Sewing Machines.—This invention consists in providing the feed wheel with a concentric annular flange, projecting from it at one side near its periphery, and having a clutch or driver fitted upon it and connected by a link with the operating lever, which has the axis of the wheel for its fulcrum; and being arranged in such a manner that the feed wheel will be operated with certainty and precision without the liability of the clutch or driver sticking or slipping either on account of wear or other causes, and the feed wheel at the same time rendered capable of being operated with less power than usual. O. C. Phelps, of New York City, is the inventor of this improvement.

Apparatus for boiling Liquids.—The boiling and heating of water and other liquids by the injection of steam thereinto is very commonly practiced in sugar-houses and other manufacturing establishments. The common mode of effecting this is simply to insert the end of the steam pipe into the lower part of the tank, vat, or other vessel, in which the boiling or heating is to be effected, and the steam in its issue from the pipe creates such a commotion in the liquid as not only to make a very objectionable noise, but even, when the operation is on a large scale, to shake the building in which the process is to be performed. The object of this invention is to prevent this commotion of the liquid; and to this end it consists in surrounding the mouth of the steam pipe with a larger open tube through which the issue of steam is caused to produce a rapid but easy circulation of the liquid. Peter Hogg, of Brooklyn (E. D.), N. Y., is the inventor of this improvement.

ON THE EBULLITION OF WATER AND BOILER EXPLOSIONS.—"Water, when deprived of air," says M. Dufour, "as Mr. Grove has shown, does not boil steadily, and hence he thinks boiler explosion results. Let it be kept well supplied with air, then, by carrying into the boiler two platinum wires connected with a voltaic pile."

EUROPEAN KNOWLEDGE OF AMERICAN GEOGRAPHY.—Galignani says:—"Many persons inquire what is the meaning of the word Kearsarge, the name of the vessel which sunk the *Alabama*. Kearsarge is a river in the southern part of North America, falling into the bay of Vera Cruz."

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING AUGUST 2, 1864.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

43,660.—Hinge.—James S. Arthur, Cordaville, Mass.:

I claim a hinge, A A', having an interior chamber, B B', for the reception of a spring or springs, C, substantially as herein described and for the purpose explained.

43,661.—Wringing Machine.—Selden A. Bailey, Woonsocket, R. I.:

I claim, first, A core or cylinder made of wood or metal with a number of holes bored towards the center of the shafts, for the purpose specified, in combination with rubber vulcanized in and on to the same, forming a roller, for the purpose described.

Second, The strap or regulator, fig. 3, in combination with geared rollers, substantially as set forth.

43,662.—Spring Bed Bottom.—Joshua Barnes, New York City:

I claim the peculiar side springs, H, connected by the cross-bars, B, in combination with an extra support to the slats, A, of gum elastic springs, F, in the manner substantially as above described.

43,663.—Wind-mill.—James Barton, Peru, Ill.:

First, in combination with the deflectors, B, I claim the sails, A, the whole being constructed and arranged in the manner herein described and operating in mutual connection to govern the force of the wind applied to the wheel, as set forth.

Second, I claim the lever, C, and rope or chain, D, employed in connection with a suitable weight to arrest the motion of the wheel, substantially as herein described and represented.

43,664.—Submarine Excavator.—J. R. Benjamin, New York City:

I claim the combination of the excavater, A, with the bow of a vessel, substantially in the manner herein shown and described.

I also claim the point wheel, E, in combination with the excavator, as and for the purpose herein shown and described.

I also claim the employment of the wheel, C, with the excavator, A, substantially as and for the purpose herein shown and described.

I also claim the employment of the swinging scrapers, D, constructed and operating sustantially as herein shown and described.

I also claim the combination of the digger, F, with the scraper, D, substantially in the manner and for the purpose herein shown and described.

I further claim the combination of the bow excavator, A, and the sides crapers, D, substantially in the manner and for the purpose herein shown and described.

[The object of this invention is to remove sand bars and other obstructions in harbors, rivers, docks, etc. A suitable steam vessel is provided and upon the bows thereof the inventor places a large plow-shaped device so hung and arranged that it can be raised and lowered at pleasure. In order to act upon the obstruction the vessel is set in motion and the plow lowered to a plane below the keel; as the boat advances the plow is driven with great force into the sand-bar, cutting a channel there, and pushing it sidewise into ridges. Upon the sides of the vessel are swinging scoops which act upon the ridges, and draw them down, as the boat runs into deeper water.]

43,665.—Cigaretto.—Ezechel Berg, New York City:

I claim the employment or use of a mouth-piece formed of a coil, B, and applied in combination with a paper cigar or "cigaretto," substantially in the manner and for the purpose shown and described.

43,666.—Mode of inlaying and ornamenting Articles of Rubber.—C. Theador Burchardt, Brooklyn, N. Y.:

I claim the process herein before described of ornamenting the surface of India rubber by applying metal dust or filings in the required forms within the molds in which the rubber is formed before vulcanizing, in the manner and for the purposes specified.

43,667.—Material for filling Shells.—Mills L. Callender, New York City. Ante-dated Dec. 27, 1863.

I claim the use and application of asphalt, asphaltum or the like, or any of the solic products arising from the distillation of coal, crude coal-oil, coal-tar, rock oil or petroleum, natural bitumens, peat or the like, for filling shell and shrapnel for the purposes, and in the manner as above described.

43,668.—Apparatus for manufacturing Gas.—Ralph Carkhuff, Lewisburgh, Pa.:

I claim first, So constructing and setting a gas retort within a furnace that the entire surface of said retort will be exposed to the heat of the furnace, employing for the purpose the flanged holding mouth, C, substantially as described.

Second, Constructing the flanged mouth, which sustains and keeps he forward end of the retort in place of sections, substantially as described.

Third, Conducting off the gas from the retort through its crown and also through an inclined pipe, G, leading into the main, H, substantially as described.

43,669.—Method for making Bolts.—William J. Clark, Southington, Conn. Ante-dated Feb. 2, 1864:

I claim the combination and use of metallic dies for the purpose of giving angular shape to a portion of a cylindrical bolt, by compression laterally, leaving the remaining portion of the bolt in its orginal form, and which dies at the same time serve the purpose of an anvil upon which the head of the bolt is formed by upsetting a projecting portion thereof, subtantially as set forth.

43,670.—Butt Hinge.—G. F. J. Colburn, Newark, N. J.:

I claim a butt hinge constructed out of two parts, and provided with pintles and a stop, substantially as herein shown and described.

[This invention has for its object the making of a butt hinge, provided with pintles, out of two pieces of metal only, and in such a manner that the hinge may, with the same machinery used in its construction, be provided, with a stop, to admit of the hinge opening to any desired angle.]

43,671.—Cultivator.—George W. Conolly, Rochester, N. Y. Ante-dated July 20, 1864:

I claim the combination of the adjustable plow, P, with the guides, M M, said guides being constructed and arranged in the manner and for the purpose substantially as described.

43,672—Washing Machine.—Seth T. Cornell and Burton Brown, Jacksonville, Ill.:

I claim the shaft, I, the arms, P, the cog wheels, L K, and the square box, A, constructed and used in combination, substantially as set forth.

43,673.—Drill.—Richard Dudgeon, New York City:

I claim an annular drill for drilling metal provided with a proper cutting edge made of a piece of a sheet or a ribbon of metal bent around a mandrel and constituting a drill, substantially such as is described.

Second, I claim a spiral drill substantially such as is herein described, with a lip or cutting edge so arranged thereon that the resistance to the cutting tends to wind up or shorten the drill, as described.

Third, I claim a sheet metal or ribbon drill substantially such as is described in combination with a cylindrical drill stock by means of a collar and clamp screw or other equivalent attaching instrumentality, the whole being as specified.

And lastly, I claim in combination a drill made of sheet metal or a ribbon of metal, as described, for boring an annular hole and centering apparatus, the latter being within or being surrounded by the former, substantially as set forth.

43,674.—Tension Scale for tuning Pianos.—Charles R. Edwards, Niagara City, N. Y.:

First, I claim the scale, C C, Fig. 1, or any marks or substitute therefor, which in connection with the movement of the lever, A A, or other mechanical arrangement, shall show to the eye the tune tension of musical strings.

Second, I claim the hook, f, or other device made to press against a musical string, or any wire or string, between its two ends, for purposes substantially as set forth.

Third, I claim the notches in the rails, *k *k, and *k *k, and the notched foot, g, made to hug the notches in the rail, *k *k, substantially as and for the purposes set forth

Fourth, I claim the platform, I I I, resting at three points over the strings of a musical instrument, while on the platform is used the device to be moved over or nearly over each string, such device itself also resting at three points on said platform, and this substantially as and for the purposes set forth.

Fifth, I claim attaching the hook, f, or its equivalent, to the string always at the same place (in relation to either point where the end of the string begins to vibrate) by means of a gage or arm, a, by having it come in contact with the hook, f, or its equivalent, till the same is set, and then the gage or arm removed gently.

Sixth, I claim a tuning register in which is so recorded the tensions of musical strings, numbered or otherwise described, that a person by aid of the proper mechanical device may put such strings in tune by the eye instead of the ear.

Seventh, I claim the try-form, Fig. 3, substantially as and for the purposes set forth, whether adapted to the automatic tuner (with or without its platform, I I I, Fig. 1), or not.

43,675.—Wind Wheel.—Thomas B. Field, Nantucket, Mass.:

I claim, first, The turning of the wings or sails from a vertical to a horizontal position and vice-versa by means of the teeth, c, on the shafts, D, and the projections, i, on the adjustable or sliding plates, K, or the equivalents of said teeth and projections when used with the plates, K, to operate substantially as and for the purpose set forth.

Second, the bands, E, provided with the teeth, f, in connection with the catches, G, attached to the slides, H, for the purpose of retaining or holding the wings or sails during the intervals between their adjustment, substantially as described.

Third, The projections at the inner sides of the plates, K, in combination with the slides, H, to which the catches, G, are attached, all arranged substantially as shown for releasing the shafts, D, and admitting of the turning of the wings or sails, as set forth.

[This invention relates to a new and improved horizontal wind wheel, of that class in which the wings or sails are turned automatically, from an upright to a horizontal position, and vice-versa, as the wheel is rotated in a horizontal plane, under the action of the wind.]

43,676.—Key-fastener.—Herbert E. Fowler, Northford, Conn.:

I claim the slide bolt, D, provided with a notch, C, to fit over or receive a projection or lip, d, on the key, B, in combinaton with the slide, F, with knob, E, attached, and the slot, f, in the cap or socket, G, provided with the jog or recess, g, all arranged substantially as and for the purpose set forth.

[This invention relates to a new and improved guard-attachment for locks. The object of the invention is to prevent the key of the **lock, when the latter is locked and the key in the same at the inner side of the door, from being turned at the outer side of the door,** and also prevented from being forced out of the lock for the insertion of a pick.]

43,677.—Toy Gun.—James D. Frary, New Britain, Conn.:

I claim, first, the employment of a spring trigger-catch, f, secured at u, arranged (between shoulders, or pins, g' g,) so as to have but a limited vibration, substantially as and for the purpose as shown and described.

Second, I claim the arm, i, upon a fulcrum pin, s, in combination with a detached spring, k, vibrating between the fixed points, g and x, substantially as and for the purpose as shown and described.

Third, I claim the combination and arrangement of the stock, a, handle, b, barrel, c, ease, d, guard, e, trigger and spring, f h, arm and spring, i k, substantially as and for the purpose described.

43,678.—Blowing Engine.—John Fritz, Bethlehem, Pa., and James Moore, of Philadelphia, Pa.:

I claim a blowing engine having a steam cylinder, and blowing cylinder arranged side by side, and in juxtaposition with each other in combination with a cross-head, connecting rods, and crank shaft of a strength sufficient to resist the leverage imparted to the cross-head, by the transmission through the same of the power of the steam cylinder to the blowing cylinder, all substantially as set forth.

43,679.—Apparatus for cooling Parts of the Body.—Orange M. Fuller, Catasauqua, Pa.:

I claim the combination of the siphon, C D, series of serpentine tubes, A, and clamp, E, when all are constructed arranged and employed it the manner and for the purposes specified.

[This invention consists in the combination of a siphon, with a series of serpentine tubes, made of india-rubber or other flexible material impervious to water, in such a manner that by placing the buckets at different parts one on either side of a patient and applying the serpentine tubes to the head or other parts of the body to be cooled, a continuous current of cold water can be passed through the siphon and serpentine tubes from the higher bucket to the lower one, and by changing the position of the buckets the current can be reversed and the head or other parts of the body is thus cooled without requiring any special attendance.]

43,680.—Muzzle Cap for Guns exhausted of Air.—Redmond Gibbons, Oakland, Call.:

I claim the application of an annular or other recess, packed with a suitably elastic material, at the muzzle and around the gun, in combination with a muzzle cap for closing said bore, so that the air may be exhausted therefrom, and a vacuum produced, substantially as and for the purpose described.

43,681.—Attaching Trunnions to Ordnance.—Redmond Gibbons, Oakland, Cal.:

I claim the combination of attachments between the false trunnions, trunnion band and breech strap (said false trunnions being secured to the trunnion band by screws), all substantiantially as herein set forth and described.

43,682.—Corn Planter.—Joseph Golder, Sterling, Ill.:

I claim the combination of the rocking frame, G, tappet, J, rings, j j, projections, k k, studs, i i, driving-wheel, B, hoppers, D, and oscillating disks, F, located near the ground at the bottom of the said hoppers, all the said parts being constructed, arranged and operating as and for the purposes herein specified.

43,683.—Tuyere.—Samuel C. Gray, Lewisville, Ind.:

I claim the combination of the air-pipe, F, with the valve, G, and ash-pit, E, the water-pipes, H and I, the first for supplying the tank with water, and the second named for the escape of water, and the manner in which the water surrounds the pipe, F, and ash-pit, E, the shape of the tank, A A A, etc., and fire-place, B, all arranged and operating substantially as and for the purpose shown and described.

43,684.—Force Pump.—C. B. Guy, Lybrand, Iowa :

I claim the pump in combination with the force or eduction-pipe, loaded lever and windlass, all arranged to operate in the manner substantially as and for the purpose herein set forth.

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[This invention is more especially designed for domestic purposes, and has for its object the elevating of water from springs, wells, etc.- and forcing it to any convenient distance or hight by a very moderate expenditure of power, and comparatively inexpensive means.]

43,685.—Newspaper Clamp.—John D. Hall, Philadelphia, Pa. Antedated July 21, 1864 :

I claim the employment or use of two strips, A A, each provided with a longitudinal groove, a, to receive a metal wire or rod, C, in connection with springs arranged as shown or in any equivalent way, to keep the parts of the strips which the grooves, a, are made in contact, and confine the wire or rod, C, with the papers around it within the grooves, substantially as and for the purpose herein specified.

[This invention consists in the employment or use of two strips, provided each with a groove in which a wire or rod is fitted, said strips being arranged with springs in such a manner that the wire or rod will be retained within the groove and the papers which are folded around the wire or rod firmly secured in the groove.]

43,686.—Churn.—S. Z. Hall, Camden, N. J.:

I claim any convenient number of curved ribs, b, arranged on the bottom of the barrel, in combination with the spindle, B, arms, c e e, and their flutter wheels, F.

43,687.—Machine for roughening Pavements.—Ephraim Hambujer, New York City :

I claim the adjustable hinged sockets, k, applied to the pounders, H, in combination with the tools, L or L', constructed and operating substantially as and for the purpose shown and described.

43,688.—Saw-mill. James Hamilton, New York City :

I claim the inner or auxiliary saw-gates or frames fitted to slide laterally in the main saw-gate, substantially as and for the purposes specified.

43,689.—Making Tin Boxes.—Charles J. Haywood, Durham, Conn.:

I claim the machine constructed and arranged substantially as and for the purpose herein shown and described.

43,690.—Rotary Engine.—Wm. Hinds, Little Falls, N. Y. Ante-dated July 25, 1864 :

I claim, first, The construction and arrangement of the segments, E, that guide and control the piston, D, so as to avoid contact or friction with the slots or ways in which the piston moves.

Second, I claim constructing the piston, D, with a slot through it, to work over the shaft while it is moving across the cylinder.

Third, I claim the steam valve made with a single port for the admission of steam into the chamber of the valve, to be ejected from thence through a series of ports into the chambers, I, and thence into the cylinders; from whence it escapes through the chambers, I, and ports, K, into the chamber, M, and exhausted through the port, N, all of which is constructed substantially as and for the purposes set forth in the specification.

43,691.—Injector for heating Liquids.—Peter Hogg, Brooklyn, N. Y.:

I claim the employment, in an apparatus for boiling or heating liquids by the injection of steam thereinto, of a larger open tube, B, surrounding the terminal portion of the steam pipe, substantially as and for the purpose herein specified.

43,692.—Roller for Wringers.—Robert B. Hugumin, Cleveland, Ohio :

I claim the slotted shafts, A A, and sheets, B B, substantially as and for the purposes specified.

43,693.—Grain and Seed Separator.—Benjamin S. Hyers, Pekin, Ill.:

I claim, first, Mounting the sliding shutters, C C, on one or more horizontal rods, c, of metal or wood, passed through apertures in the said shutters, in the manner shown and described.

Second, The pivoted distributors, D' D', adjusted simultaneously in corresponding positions, substantially as described.

Third, The combination of the hinged board, I, link, i, and pin, i', employed in the manner described, to support the rear end of the screen, H, at any desired hight.

Fourth, The combination of the two screens, H K, moved simultaneously in opposite directions by means of the rock shaft, J, arms, h' h', and link, k, substantially as specified.

Fifth, The combination of the series of pins, r r r, and adjustable rod or bar, R, with the rock shaft, J, and screens, H K, for the purpose of varying the motion of the said screens without changing the motion of the shoe.

Sixth, The spout, S, suspended from the stationary frame by hangers, s s, and receiving a shaking motion in excess of that of the screen, by means of the rod, S', and pivoted bar, s', or their equivalents.

Seventh, The combination of the hinged discharge door, L, and button, L', arranged in the described relation to the grain board, M, and screens, H K, for the purpose specified.

Eighth, The toothed catch, U', applied to the gate, U, in the manner shown and described, so as to support the said gate at any desired hight, or by pressing it upward against the gate to permit the closing of the latter.

Ninth, The strips, T2, applied as described above, the joints between the hopper, T, and gate, U, in combination with the transverse bar, V, without necessitating the use of supporting strips extending lengthwise of and beneath the said joints.

Tenth, The notches, f2 f2 f2, formed in the sides of the shoe, D, at right angles to, and communicating with, the grooves, F2, therein, for the purpose of receiving the pins, e or f, projecting from the edges of a chess-board or riddle, and permitting the rear end of the latter to be adjusted upward or downward in relation to the pivoted strips.

43,694.—Fishing Tackle.—A. J. Lenhart, Trenton, N. J.:

I claim the combination of the hollow sinker, A, spring, B, and hook rod, C, substantially in the manner herein shown and described.

I also claim the combination with the above-named parts, of the spring, H, trigger, E, and bait-line, F, operating together, substantially in the manner herein shown and described.

[The inventor names this contrivance the "Sure Pop." It consists of a spring hook arrangement attached to a sinker in such a manner that when the fish attempts to nab the bait, he is himself nabbed by the sudden action of the springs. The device is said to be very certain in its operation, leaving a hungry fish but a poor chance of escape.]

43,695.—Artificial Fuel.—H. S. Lucas, Chester, Mass.:

I claim a fuel produced by combining and compressing fine coal and peat, substantially as set forth.

I also claim in a fuel made from coal and peat combined, the employment of peat from which the undecomposed portion has been artificially removed.

43,696.—Photographic Album.—Edward Maynard, Washington, D. C.:

I claim a self-adjusting photographic album or portfolio, having an elastic strap or loop, D, secured upon one leaf thereof, and combined with a retaining cord, e, and other parts of the album or portfolio, substantially in the manner and for the purpose herein set forth.

43,697.—Harvesting Machine.—R. W. McClelland, Springfield, Ill.:

I claim the making of the sickle-bar in a dove-tail or wedge form, and forming a corresponding female dove-tail on, or out of, the metal of which the blades are made, so as to slide over and snugly fit upon said sickle bar, substantially in the manner and for the purpose herein described.

43,698.—Saw-filing Machine.—J. S. McCune, Salem City, N. J.:

I claim, first, The clamp formed of the bars, A A, in combination with the slide, D, file-frame, F, and gage, H, all arranged substantially as and for the purpose set forth.

Second, The part, e, of the support, E, provided with the uprights, f f, in connection with the bar, g, of the file-frame, all arranged for the purpose of regulating the depth of the file cut or length of the teeth, as set forth.

[This invention consists in the employment or use of a clamp in connection with an adjustable sliding file-frame and a gage, all arranged in such a manner as to admit of saws being filed with the greatest facility, and in a perfect manner, even by a person not well skilled in such work.]

43,699.—Corn Planter.—O. C. McCune, Pleasant Valley, Ohio :

I claim, first, Operating the seed slide, I, through the medium of the handles, F F, the latter being connected to the former, and all arranged substantially as and for the purpose herein set forth.

Second, Operating the valve, L, in the tube, K, through the medium of the handles, F F, substantially as set forth.

Third, Attaching the furrow-share, M, to a beam, O, which is connected by an elastic plate, P, to the main beam, A, of the machine, all arranged substantially as and for the purpose herein set forth.

[This invention relates to a new and improved corn planter, of that class in which the seed-dropping mechanism is operated by the attendant while grasping the handles of the machine, and guiding the same as it is drawn along.]

43,700.—Rotary Harrow.—H. H. Monroe, Thomaston, Maine :

I claim the beam, B, provided with the bend, f, and having its ends elevated, in combination with the harrow, A, and bearing, d, arranged and operating substantially as herein set forth.

In combination with the beam, B, harrow, A, and bearing, d, I also claim the elongated joint rod, k, and the hinged arm, C, provided with the weighted roller, l', so arranged that the position of said roller on the rim may be varied, substantially as herein specified.

43,701.—Sugar-boiling Apparatus.—M. D. Mudget, Eden, Vt.:

I claim the combination for raising the sap from off the furnace and transferring it to horses or supporters near the same, the said combination consisting not only of the carrriage, H, with its hangers or suspension rods, m m m m, the movable railway, G, and the mechanism (that is, the lever, k, the connecting rods, l l, the cranks, i i, the shafts, g g, and the cams, f f f f) for raising the latter and the carriage, but of mechanism (viz: the windlass, s, and the ropes, o p), for moving the carriage along on the railway, as specified.

I also claim the combination of the siphon supply tube with the furnace, A, substantially in manner and so as to operate with it, the reservoir and sap-pan, as specified.

43,702.—Horse Rake.—John Partridge, Pittsfield, Mass.:

I claim the attaching of the rake-head, G, by hinges, c, to bars, E, which are connected to the thills, C C, by hinges, b, in combination with the levers, Q R, provided respectively with the shoulders, g j, to sustain the bar, J, and the bars, E E, all arranged in connection with the arms, L M, and rock shaft, N, to operate substantially as and for the purpose set forth.

43,703.—Measuring Nozzle for Liquid Jars.—John H. Pein, New York City :

I claim the measuring tube, substantially as herein described.

43,704.—Sawing Machine.—P. B. Perkins, Almond, N. Y.:

I claim the tilting platform, H, with nicks, h, in combination with the double crank hand lever, I, and saw, G, all constructed and operating in the manner and for the purpose substantially as herein shown and described.

[This invention consists in a reciprocating saw hinged directly to the cross-head of a steam piston, and guided by rollers secured in a standard, which rises from a tilting adjustable platform in such a manner that by the action of a double crank head lever on the platform the saw can be raised or lowered without stopping the engine, and the power with which the saw bears upon the log can be regulated at pleasure, and by dropping the hand-lever into notches in the share end of the tilting platform, the outer end of the same, together with the saw, are held in an elevated position, thus giving a chance to the operator to shift his log or perform any work of a similar nature without stopping the engine or paying any attention to the saw.]

43,705.—Feed Wheel of Sewing Machines.—O. C. Phelps, New York City :

I claim operating the clutch or driver from the lever through the medium of a link which is between the fulcrum of the lever, and the flange, which the clutch or driver grasps or clamps in turning the feed wheel, substantially as described.

43,706.—Bag-holder and Measure.—George E. Randall, Yaphank, N. Y.:

I claim, first, The slides, G G, in combination with the measure, E, and frame, A, or any suitable support, all arranged substantially as and for the purpose set forth.

Second, The shafts, L, arranged in quadrangular form, provided with hooks, N N', and connected by gears, M, for the purpose of holding the bag and admitting of the same being liberated therefrom with facility, as herein described.

Third, The combination of the measure, slides, and shafts, provided with hooks, all arranged and applied to a suitable frame or support, substantially as and for the purpose set forth.

[This invention consists in combining a bag-holder with a measure in such a manner that a bag may be firmly held with an open mouth for receiving the grain or other substance, and the latter measured before it is allowed to enter the bag, all the parts being arranged in such a manner that grain or other substance may be measured and bagged by a single individual with the greatest facility.]

43,707.—Machine for cutting Button-holes.—George Rehfuss, Philadelphia, Pa.:

I claim a movable base, F, constructed substantially as described, and having two or more incisions of different lengths in combination with a button-hole cutting die.

43,708.—Car Spring.—G. Adolph Riedel, Philadelphia, Pa.:

I claim, first, Constructing a spring in one or more sections, which have one or more sheets, plates, or layers, in which each sheet has a plurality of resilient parts, centrally arranged or otherwise, substantially in the manner and for the purpose above set forth.

Second, The washers, C C C, when interposed between the spring plates, B B B, substantially in the manner described.

Third, Combining one or more central washers, F, with the resilient parts of the spring, substantially as described and for the purpose above set forth.

43,709.—Revolving Fire-arm.—Charles Robitaill and Florian Dahis, Brooklyn, N. Y.:

We claim a groove inside the front end of the chamber of a revolving cylinder receiving the springing edges of the cartridge case, for the purposes and as specified.

43,710.—Hoop Skirt.—Leopold Sanders, New York City:

I claim an expanding and contracting hoop skirt having its front tapes, A A', provided with eyelets, D, for the hoops, B, to pass through, substantially as herein specified.

[This invention relates to an improvement in that class of hoop skirts in which the hoops are allowed to expand and contract, and it consists in having the two front tapes of the skirt provided with eyelets for the hoops to pass through, whereby much friction is avoided in the working or moving of the hoops, as well as abraision of the working or moving parts avoided.]

43,711.—Evaporator for Saccharine Juices.—A. A. Sawin, West Irving, Iowa :

I claim, first, The employment or use, in a sugar evaporating pan, of side pans, c c', one or more, arranged in connection with return flues, D D, of a furnace provided with suitable dampers, F, substantially as and for the purpose herein set forth.

Second, The movable partitions, K K, one or more, arranged in the side pan, c', and notched at their lower ends, substantially as and for the purpose herein set forth.

Third, The sinker or dumb waiter, M, one or more, when used in connection with a sugar evaporating pan, for the purpose herein set forth

Fourth, The scum receptacles or vessels, L, placed at each end of the box, G, as set forth.

[This invention relates to the employment or use of side pans or boilers with a main pan, all arranged in connection with a furnace, return flues, dampers, gates, and other concomitant parts, whereby a very desirable and efficient device is obtained for the purpose of evaporating saccharine juices.]

44,712.—Machine for making Spikes.—Samuel Severance, Pittsburgh, Pa.:

I claim, first, The means substantially as herein described for giving a lateral movement simultaneously with its advancing movement, to the heating tool, b, for the purpose set forth.

Second, Adapting spike and bolt, or rivet machinery for making heads of various sizes on the rods by the employment of an adjustable cutter, g, applied, operated, and operating substantially as described.

Third, The combination of the griping jaws, c c', pivoted header, b, guide, d', and cutter, g, operating substantially as described.

Fourth, The combination of the retractor, h, and the lever, J, with an adjustable cutter, g, substantially as and for the purposes described.

43,713.—Corn Sheller.—Joseph Shipe, Upper Augusta, Pa.:

I claim the spout, G, when constructed and operating substantially as and for the purpose herein set forth.

43,714.—Device for preserving the shape of Pantaloon Legs.—Wm. D. Sinclair, Trenton, N. J.:

I claim the employment or use in the bottoms of the legs of pantaloons, of hoops or bands, constructed of sheet-metal, whale-bone, wood, or other suitable material possessing a requisite degree of firmness and elasticity, substantially as and for the purpose specified.

[This invention is designed as a substitute for the buckram and canvas lining now used in the bottoms of the legs of pantaloons, for rendering the same stiff and keeping them in proper shape over the boot or shoe.]

43,715.—Machine for enameling Oval Picture Frames.—Frederick Smith, Allegheny City, Pa.:

I claim, first, The use of the adjustable cam, e, and sliding table, b when used in combination with the base, a, upright piece, g, tram mel, i, and tool-holder, s, constructed, arranged, and operating substantially as herein described and for the purpose set forth.

Second, The combination of the circular and reciprocating motion when used in connection with the above device, and for the purpos herein set forth.

43,716.—Corn Harvester.—John W. Smith, Iowa Point Kansas :

I claim, first, The application of a vertically adjustable platform to the sled runners, A, of a corn harvester having the stalk cutter applied to said platform, substantially as hereinafter described.

Second, A corn harvester which has an adjustable platform carrying a stalk cutter, in combination with a stuble cutter arranged on one side of the stalk cutter and operating simultaneously therewith, substantially as described.

Third, The combination of two knives in a corn-stalk and stubble-cutting machine, when these knives are arranged at right angles, or at opposite angles to each other, or in such manner that the stubble cutter will counteract the side draft on the stalk cutter, substantially as described.

Fourth, The use of side guides, D D, in combination with a platform which is vertically adjustable on its carriage, A A, substantially as described.

43,717.—Shingles for Roofing.—T. H. Squire, Elmira, N. Y.;

I claim the constructing of shingles for roofing purposes with one or both ends beveled or tapered, as herein shown and described.

43,718.—Fastening Timbers.—Henry Stanley & Reuben Cornins, Troy, N. Y.:

We claim a clamp composed, constructed, and combined with the timbers to be joined, in the manner substantially as and for the purposes herein described and set forth.

43,719.—Bedstead Bottom.—John Christopher Stuck, Boston, Mass.:

I claim the above combination and arrangement of the slat-supporting rods, d d, the series of elastic rings or loops, e e e, and their sustaining rods, c c, with the series of slats, g g, &c., and the bedstead frame.

And I also claim the combination of the two hooks, h h, with each of the slats, g, the rods, e e d d, and the series of elastic loops or springs, e e e, supported by or applied to such ends, substantially as described.

43,720.—Stock Car.—Wm. Stark, Bronson, Mich. Ante-dated July 21, 1864 :

I claim, first, The arrangement of the X-shaped hinges, p, in combination with the shutters, o, and hooks, r, as and for the purpose set forth.

Second, The arrangement of the vertically movable eye-bolts, m, in combination with the hinged caps, l, apertures, k, and hooks, m', as and for the purpose described.

[The object of this invention is to facilitate the feeding and watering of the stock, to provide for a thorough ventilation of the car, to increase the capacity of the same by introducing a movable deck and to provide the means for sprinkling the stock in the car in an easy and ready manner.]

43,721.—Combined Seeder and Cultivator.—Thomas Thomas, Plattsmouth, Nebraska :

I claim, first, The construction and arrangement of the frame and the mode of attaching and detaching the several parts, so that it is convertible into a corn-planter and cultivator, a wheat drill and roller, or a broad-cast sower.

Second, I claim the cross bars, p p, in the hopper, over the holes in the bottom of the same, in combination with the holes, n n, and the vertical pins, r r, in the slide, and the manner of regulating the quantity of seed to be sown, by changing the crank screw or pin, o, in the manner herein described.

Third, I claim the vibrating fork, H, arranged and operating in the manner as and for the purposes herein set forth.

Fourth, I claim the mode of attaching the draught-pole to the machine, so that the depth of planting, or drilling in the seed, and the position sideways may be controlled by the driver in his seat.

43,722.—Tightening Fellies.—Henry Thompson, Palmyra, Wis.:

I claim the metallic box composed of two parts, A A, provided each with a partition, a, to divide said parts into two compartments, b b', in connection with the guide-plate, B, and the adjustable wedge-seaped head, C, all arranged and applied to the wheel, substantially as and for the purpose herein set forth.

[This invention relates to a new and improved attachment for the wheels of vehicles, and it is designed to compensate for the shrinking of the wheel so that the fellies or rim may be expanded whenever required, to cause the tire to always fit snugly thereto, thereby avoiding the necessity of cutting and rewelding the tire or shrinking the same which is now done when the tire becomes loose, on account of the shrinking of the wheel.]

43,723.—Fumigator.—H. W. Todd, Chicago, Ill.:

I claim the arrangement and combination of the parts consisting of the bellows, A, with the smudge chamber, B, over its valve, with a perforated partition, I, to sustain the smoking material, and a perforated lid, C, to admit air, as described and represented.

43,724.—Sawing Machine.—E. Totman, Columbus, Pa.

I claim the frame, M, attached to a box, G, on a vertical shaft, C, and provided with a shaft, K, having a wheel, L, upon it near one end and connected at its opposite end by an universal joint, a, to a shaft, H, in connection with the bevel gearing, I J, placed on the shafts, H and C, the crank-wheel, D, on the lower end of shaft, C, the pitman, E, and saw, F, all arranged to operate substantially as and for the purpose set forth.

[This invention relates to a new and improved machine for sawing logs and timber transversely, designed more especially for sawing logs into suitable lengths for fuel.]

43,725.—Potato-parer.—Henry Underwood, Tolland, Conn.:

I claim a knife for paring potatoes, provided with a bit or reamer, C, at the end of a blade, B, substantially as herein set forth.

[This invention consists in provding an ordinary knife blade with

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a bit or reamer at its end, so constructed that after the skin is cut or pared from the body or principle part of the potato, the bit or reamer may be inserted in the recesses or eyes, turned within them and the exterior coat or skin within said recesses removed with the greatest facility and without any waste.]

43,726.—Soda Fountain.—Dewitt C. Wade, Holley, Mich.:

I claim passing the carbonic acid gas thro gh a tube, D, directly to the tumbler or drinking glass containing the fluid designed for a drink, substantially in the manner herein shown and described.

43,727.—Strap for holding down Pantaloons.—C. F. Walker, Benford's Store Post-office, Pa. Ante-dated June 14, 1864:

I claim the device composed of the parts, C D and E, when the same are used in combination with the sticks, a b b, or equivalents secured in the hem of the pants, substantially as herein set forth.

43,728.—Colored Paper Shirt Collars.—S. W. H. Ward, New York City:

I claim as a new article of manufacture a colored paper collar, made as set forth.

[This invention consists in a paper collar colored in imitation to colored collars of linen, muslin or textile fabrics either by printing or by other suitable means in such a manner that said colored paper collars will take the same relation towards the ordinary colored collars of textile fabrics which the white paper collars take towards the ordinary white collars of textile fabrics and a cheap colored collar can be produced which when new and fresh will form a good substitute for the colored collars of textile fabrics.]

43,729.—Rotary Engine.—Charles & Stephen Weed, Eldorado, Iowa:

We claim the combination of the hollow shaft, D, curved piston, E, partition, c, supply port, b, exhaust port, b', plurality of sliding abutments, d d', closed cavities, a a, and springs, e e, when all the said parts are constructed and arranged in the manner and for the purposes specified herein.

43,730.—Lantern.—Wm. Westlake, Milwaukie, Wis.:

I claim the guard, a, with the top part or dome, c, and the globe or glass, d, with the base or bottom part of the lantern, by which the guard and upper part or dome may readily be attached to or detached from the bottom part or body and globe or glass, substantially as herein set forth.

43,731.—Adhesive or Gum Paper.—S. Lloyd Wiegand, Philadelphia, Pa. Ante-dated July 25, 1864:

I claim the application of gums, substantially in the manner or in any equivalent, and with the effect hereinbefore set forth.

43,732.—Composition for Carbonizing Iron.—C. V. Wilson, Newark, N. J.:

I claim the employment of a composition made of the ingredients herein specified which are ppplied in about the proportion above set forth in combination with or without a case.

[This invention relates to composition by which iron of any description, cast, wrought, or malleable, can be hardened to any desired depth, by placing the same in a case, which is packed with said composition, and heating it from one to ten hours, according to the depth to which it is intended to harden the same.]

43,733.—Breech-loading Fire-arm.—James Bowness, Prince Edward's Island, assignor to himself and Wm. Ross, Boston, Mass., assignors to said Bowness:

I claim the improved gun as constructed with the sliding barrel, C, and the tilting breech, B, and as having the recession spring, e, combined with the locking spring catch, f, and the thumb-piece or projection, d, as arranged together and applied to the stock and barrel, substantially as specified.

I also claim the improved gun as constructed with the sliding barrel, C, the tilting breech, B, the recession spring, e, the locking catch, f, the thumb projection, d, and the retaining catch, g.

I also claim the arrangement of the cartridge cutter, h, within the rotary or tilting breech, B, as described, viz: so that the cartridge while being forced into the said breech, B, shall be cut or torn longitudinally by such cutter.

43,734.—Car Coupling.—Ebenezer Carey (assignor to himself and Horace H. Hawley), Burlington, Iowa:

I claim the suspended or swinging plate or pin-support, B, fitted within the draw-head, A, and provided with a projection, f, at its upper end, in combination with the pin, C, and link or shackle, D, all arranged to operate substantially as herein described.

[This invention relates to a new and improved car coupling which is self-acting or self-coupling, and it consists in the employment or use of a suspended pin support, a pin of peculiar construction and the ordinary link or shackle, all arranged and combined with a draw-head in such a manner as to form a simple and efficient coupling of the kind specified.]

43,735.—Machine for making Confectioner's Pipe.—Oliver P. Chase, Boston, Mass., assignor to himself and Lewson E. Chase, Charlestown, Mass.:

I claim the combination and arrangement of the series of endless aprons, C D E, with a cutting apparatus or rotary knife, G.

I also claim the combination and arrangement of the knives or cutters, S S', with the endless aprons or bands, D E, substantially as and for the purposes set forth.

I also claim the combination and arrangement of the condensing or gage roller, R, the series of endless aprons, C D E, and the revolving cutter, G, the same being substantially as and for the purpose specified.

43,736.—Basin Faucet.—William P. Clark, Charlestown, Mass., assignor to himself and William T. Vose, Newtonville, Mass.

I claim the improved faucet as made with the elastic and water-proof septum, S, the means of confining such septum to the valve stem and valve case, (such means being the shaft, h, the septum holder, C', the parts e f, and screw, g,) the mechanism for guiding and operating the valve (such being the recesses, m m, the studs t t, the screw, D, and the key, E,) and finally the recess, i, and projection, k, or their mechanical equivalents, the whole being arranged and so as to operate together substantially as hereinbefore specified.

43,737.—Folding Paper Collar.—J. H. Darlington (assignor to himself, A. B. Tainter and F. D. Jackson), New York City:

I claim folding paper collars by means of a folder or blade that carries the collar through a slot or mortice in a bee, substantially as specified.

43,738.—Horse-power.—George Lewis, (assignor to himself, Ralph Hoyt and C. W. Hoyt,) Panama, N. Y.:

I claim the adjustable frame, E, secured to the revolving sweep, D, combination with the stationary master wheel, A, central shaft, C, and secondary shaft, F, all constructed and operating in the manner and for the purpose herein shown and described.

[This invention consists in a revolving frame connected to and adjustable on the sweep which turns loosely on a vertical shaft passing thro gh the center of the stationary master wheel, in combination with suitable pulleys and belts, one of which winds round the master wheel and round a pulley mounted on an arbor which has its bearings in the revolving frame and which also has another pulley mounted on its upper end, from which a second belt extends to a pulley on the upperend of the central shaft of the master wheel, in such a manner that by turning the revolving frame towards or from the center, the belts which transmit the motion from one shaft to anotner can be slacked or tightened as may be required, and by carrying the movable frame round the master wheel a rotary motion is imparted to the central shaft which can be transmitted by suitable belts or pulleys to the working machines which are to be set in motion by the horse gower.]

43,739.—Locomotive Car Truck.—Robert H. Long, (assignor to himself, Joseph G ice, of New York, and Samuel B. Grice,) Philadelphia, Pa.:

I claim the combination at one end of the car or locomotive of a four-wheel truck, C, and a vibrating truck, E E', pivoted together and to the car body in the manner and for the purpose herein set forth.

[The object of this invention is to enable railroad cars to turn or curve more freely, more especially on curves of short radius such as are used in city railroad tracks; and to this end it consists in the combination at one end of the car, of a four wheel truck or frame, and a vibrating truck or frame, the four wheel truck having the axles arranged within it in the usual manner, and being pivoted between the axles to the vibrating truck or frame and the latter being pivoted to the main frame or body of the car at a point not over or between the axles.

43,740.—Saw-mill.—Algernon S. Petticrew, Dayton, Ohio, assignor to Owens, Lane, Dyer & Co., Hamilton, Ohio:

I claim, first, The auxiliary dog, J, with its accessories, D E F G G' H I i K, or their equivalents, for counteracting the spring of the log, in the manner described.

Second, The provision of the counter dog, M m N, for the prevention of canting or rolling, as set forth.

43,741.—Pressing Paper Collars.—Edgar E. Ranous (assignor to H. B. Tainter and F. D. Jackson), New York City:

I claim the rollers, constructed substantially as specified, to act only upon the fold of the collar, in combination with a guide for keeping the collar in its position as presented to such rollers, as set forth.

43,742.—Sewing Machine.—George Rehfuss, Philadelphia, Pa., assignor to the American Button-hole Sewing Machine Company:

I claim, first, The spool case holder, T, operated by the scroll cam, g, arms, P and P''', segment, q, and wheel, v, or other equivalent devices, for communicating an oscillating motion to the said spool case holder.

Second, The spool case holder, T, with its journals or trunnions, u, in combination with the detachable brackket, S, or its equivalent, the whole being constructed substantially as and for the purpose herein set forth.

Third, The detachable arm, P''', and its segment, q, in combination with the spool case, T, and the wheel, v, on one of the trunnions of the said case.

43,743.—Skimming Attachment for Sugar Evaporation. John Findley Riggs, Fremont, Nebraska Ter., assignor to himself and S. G. Daily:

I claim, first, The skimmer, I I, operated by a lever, cam, or other suitable device, through the medium of pivoted levers, D E F H J J, substantially in the manner and for the purposes herein set forth.

Second, I claim the cords, M O O, and hinged wires or rods, N N, arranged substantially as described, and operating to cause the skimmers to move in an exact plane across the face of the liquid being evaporated, as explained.

Third, I claim the partitioned trough, P P1 P2 P3, employed for separating the useful from the worthless scum, substantially as described.

43,744.—Rotary Engine.—John B. Root (assignor to Root's Rotary Engine Company), New York City:

I claim the stationary pin, I, secured in the center of one of the cylinder heads, entering a central cavity in the piston drum, and connecting and serving as center-bearing for the several pistons within the drum, substantially as herein specified.

[This invention relates to that description of rotary engine whose inner rotary cylinder or drum, to which the pistons are attached, is arranged eccentrically within a larger stationary cylinder. It consists in an improved mode of obtaining the center-bearing for the pistons, whereby the construction of the engine is simplified, and a larger steam space may be obtained in a cylinder of a given diameter.]

43,745.—Wood-bending Machine.—Wm. H. Ryan (assignor to himself and T. E. C. Brinley), Louisville, Kentucky:

I claim the combination of the forming block, B, with its hooked projection for the retention of the plate, d, by its lugs, g, in the act of springing the timber, the strap, D, and the rod, E, by which the bow is retained in its bent condition.

[A peculiar combination of parts is here presented, by which plan handles, and various articles, may be quickly and conveniently bent, and then locked, in bent position, until by seasoning they have become permanently set. The simplicity of this device will form a strong recommendation for its general introduction.]

43,746.—Hinge.—William Webb, assignor to the Scoville Manufacturing Company, Waterbury, Conn.:

I claim a hinge provided with a stop formed during the process of the manfacture of the hinge and out of the same parts or pieces composing the same, substantially as herein described

[This invention relates to an improvement in that class of hinges which are formed out of a sheet or rolled metal plate, and are commonly termed butt hinges. The invention consists in providing said hinges with a stop constructed during the process of their manufacture, and in such a manner that a combined hinge and stop will be obtained at a cost not appreciably greater than that of the hinges constructed separately or without the stop.]

43,747.—Removable Corks for Horse-shoes.—George W. Griswold, New York City:

I claim surrounding or embedding removable corks or toe-pieces for horse-shoes, in vulcanized rubber, or other equivalent elastic materials, for the purpose of holding the corks firmly in place, and relieving the strain or jar upon the foot of the animal, substantially as described.

43,748.—Mode of treating Animal Charcoal.—Edward Beanes, London, England:

I claim the employment or use in treating animal charcoal with such other chemical compounds besides chlorine, or hydrochloric acid gas, which, when brought in contact with the contaminated coal, will form soluble compounds with the lime and other metallic, earthly and alkaline impurities contained therein, so that the same can be washed out, and the original decolorizing and absorptive properties of the coal are restored.

43,749.—Steam Boiler.—Louis Emile Constant Martin, London, England. Patented in England, Nov. 12th, 1863:

I claim, first, Constructing a steam-boiler by combining a central with an external boiler, and uniting them by a tubular water space, substantially as and for the purpose set forth.

Second, The combination of the central, horizontal water space, having vertical heating tubes, within the central boiler, and the horizontal heating tubes passing through the central boiler, substantially as and for the purpose set forth.

Third, The combination of an annular combustion chamber between the boilers with a central combustion chamber, so that the heated products of combustion from the former shall pass through the latter, as and for the purpose set forth.

Fourth, The combination of a dam and the register with the central combustion chamber, substantially as described, to regulate the draft through the chamber, and the quantity of combustion in both chambers, as set forth.

Fifth, The combination of the annular combustion chamber between the boilers, with the base plate of the whole boiler, and the annular chamber beneath the plate for superheating steam, substantially as and for the purpose set forth.

43,750.—Feed-water Heater for Steam Boilers.—Louis Emile Constant Martin, London, England. Patented in England, Jan. 12th, 1864:

I claim, first, A heater for the supply water of steam boilers having removable plates, whether separate or united with an internal cylinder, when constructed, arranged and operating substantially in the manner and for the purpose set forth.

Second, The combination of the perforated diaphragm, C', with the pipes, C, and the diaphragm, C'', on the upper chamber of the heater, A, constructed substantially as and for the purpose set forth.

Third, Supplying feed water to steam boilers in minute drops or spray when heated by the direct contact of superheated steam, substantially in the manner and for the purpose set forth.

43,751.—Mode of unlading Vessels.—George Milsom, Henry Spendelow, and George V. Watson, Buffalo, N. Y.:

We claim the supporting shieves, E E', and ropes or chains, D, and one or more scoops, C, or shovels, K, or rakes, L (or the equivalent of either thereof), arranged or used within the hold or compartment of the vessel where the grain is, in combination with a reciprocating motion communicated to said scoops, shovels or rakes, substantially as described, for the purposes set forth.

RE-ISSUES.

1,733.—Method of hanging Reciprocating Saws.—Leonard Anderson, Painesville, Ohio. Patented Jan. 17, 1860:

First, I claim locating the pin, K (which connects the saw, B, with the pitman, H) above the fulcrum pin, b, of the said pitman, as shown in figure 2; or locating it below, as represented in figure 3—when the top of the said saw moves in slides or grooves—for the purpose of imparting to the saw a receding back motion during its upward stroke, as herein set forth.

Second, I claim the employment and use of curved slides or grooves, F', by which I am enabled to overcome or counteract the tendency of the saw, when pivoted above or below the fulcrum pin of the pitman, to move in a curved line on its downward stroke—so that, by the compensating nature of the said curved slides, the saw will descend in a direct vertical line, and cause all of its teeth to cut direct as herein stated.

1,734.—Plow.—Derastus Harper, Chicago, Ill. Patented October 21, 1862:

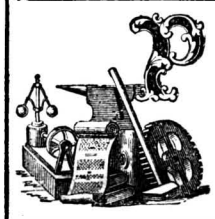
I claim, first, The standard, A, constructed of wrought iron in angle form, substantially as above set forth.

Second, The combination of the above standard with the mold-board, B, landside, C, and share, E, attached to the standard, and all arranged, as set forth.

Third, The bar or sole, F, of the landside, C, constructed of wrought-iron, in angle form, at its back part, turned upwards at its front part, and secured to the standard, as shown, for the purpose specified.

DESIGN.

1,981.—Plates of a Cook's Stove.—Isaac De Zouche, assignor to Bridge, Beach & Co., St. Louis, Mo.



PATENTS

GRANTED

FOR SEVENTEEN YEARS!

MUNN & COMPANY,

In connection with the publication of the SCIENTIFIC AMERICAN, have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *seventeen years*. Statistics show that nearly ONE-THIRD of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after *seventeen years'* experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office; but they take pleasure in presenting the annexed testimonials from the three last ex-Commissioners of Patents:—

MESSRS. MUNN & CO.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours very truly,

CHAS. MASON.

Judge Mason was succeeded by that eminent patriot and statesman, Hon. Joseph Holt, whose administration of the Patent Office was so distinguished that, upon the death of Gov. Brown, he was appointed to the office of Postmaster-General of the United States. Soon after entering upon his new duties, in March, 1859, he addressed to us the following very gratifying letter:

MESSRS. MUNN & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

MESSRS. MUNN & CO.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully, your obedient servant,

WM. D. BISHOP.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

As an evidence of the confidence reposed in their Agency by inventors throughout the country, Messrs. MUNN & CO. would state that they have acted as agents for more than TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees, at home and abroad. Thousands of inventors for whom they have taken out patents have addressed to them most flattering testimonials for the services rendered them; and the wealth which has inured to the individuals whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! Messrs. MUNN & CO. would state that they never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in their extensive offices, and

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that they are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of $5, accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of Messrs. MUNN & CO., corner of F. and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue. Address MUNN & CO., No. 37 Park Row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of Messrs. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row New York.

Patents are now granted for SEVENTEEN years, and the Government fee required on filing an application for a patent is $15. Other changes in the fees are also made as follows:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

The Patent Laws, enacted by Congress on the 2d of March, 1861, are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The law abolishes discrimination in fees required of foreigners, except natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners, except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The Government fee for a caveat is $10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

REJECTED APPLICATIONS.

Messrs. MUNN & CO. are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of their Washington Agency to the Patent Office affords them rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Their success in the prosecution of rejected cases has been very great. The principal portion of their charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with MUNN & CO., on the subject, giving a brief history of the case, inclosing the official letters, &c.

FOREIGN PATENTS.

Messrs. MUNN & CO., are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business they have offices at Nos. 66 Chancery lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. They think they can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through their agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through MUNN & CO'S Agency, the requirements of different Government Patent Offices, &c., may be had, gratis, upon application at the principal office, No. 37 Park Row, New York, or any of the branch offices.

SEARCHES OF THE RECORDS.

Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignments of patents. Fees moderate.

INVITATION TO INVENTORS.

Inventors who come to New York should not fail to pay a visit to the extensive offices of MUNN & CO. They will find a large collection of models (several hundred) of various inventions, which will afford them much interest. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

MUNN & CO. wish it to be distinctly understood that they do not speculate or traffic in patents, under any circumstances; but that they devote their whole time and energies to the interests of their clients.

COPIES OF PATENT CLAIMS.

MESSRS. MUNN & CO., having access to all the patents granted since the rebuilding of the Patent Office, after the fire of 1836, can furnish the claims of any patent granted since that date, for $1.

THE VALIDITY OF PATENTS.

Persons who are about purchasing patent property, or patentees who are about erecting extensive works for manufacturing under their patents, should have their claims examined carefully by competent attorneys, to see if they are not likely to infringe some existing patent, before making large investments. Written opinions on the validity of patents, after careful examination into the facts, can be had for a reasonable remuneration. The price for such services is always settled upon in advance, after knowing the nature of the invention and being informed of the points on which an opinion is solicited. For further particulars address MUNN & CO., No. 37 Park Row New York.

EXTENSION OF PATENTS.

Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. Messrs. MUNN & CO. are persuaded that very many patents are suffered to expire without any effort at extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents*. Patentees, or, if deceased, their heirs, may apply for the extension of patents, but should give ninety days' notice of their intention

Patents may be extended and preliminary advice obtained, by consulting or writing to MUNN & CO., No. 37 Park Row, New York.

ASSIGNMENTS OF PATENTS.

The assignment of patents, and agreements between patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American atent Agency, No. 37 Park Row, New York.

UNCLAIMED MODELS.

Parties sending models to this office on which they decide not to apply for Letters Patent and which they wish preserved, will please to order them returned as early as possible. We cannot engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure there obtaining them. In case an application has been made for a patent the model is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid) should be addressed to MUNN & CO. No. 37 Park Row, New York

Notes and Queries

A. M., of N. Y.—Stationary engines have from an eighth to a sixteenth of an inch lead, according to circumstances. There is no arbitrary rule for lead. Engineers give such lead to a valve as they deem most suitable for the work to be done. Quick working engines require more than others. Five-sixteenths of an inch is heavy lead, but five-eighths rather goes ahead of anything we ever heard of. We should call that working an engine backwards with the eccentric set to go ahead. No ordinary stationary engine would work with such "lead." It might run, but running is not always working.

A. F., of Pa.—When cotton waste or shavings are saturated with oil, a large surface is exposed to the action of the air, and if the oil has the property of absorbing oxygen it may absorb the gas so rapidly as to take fire. This is the way in which spontaneous combustion takes place. As petroleum naptha does not absorb oxygen, it never takes fire by spontaneous combustion.

J. T. P., of Ohio.—Ure says that he has tried a great many receipts for making ink, and he thinks the best is made of sulphate of iron, nutgalls, and gum; any addition injuring the ink.

A. L. C., of Nev.—If the frozen apples were incrusted with frost on being surrounded by steam, as you describe, the heat was absorbed from the steam by the apples, and you would find that they were in process of being thawed.

R. H. W., of Ill.—You will find full directions for preserving flowers in a book called "Phantom Boquets," published by J. E. Tilton & Co., Boston.

Subscriber, of Pa.—Any improvements that you invent and patent are your own, and no person can use them without your consent.

L. G., of Mass.—You can obtain the bichromate of ammonia of Professor Charles Seeley, 244 Canal street, New York.

H. B., of Wis.—Models are not returned from the Patent Office. All are retained.

E. G. P., of Ill.—The statement that people make good vinegar from grapevines we do not believe.

G. L. B., of Maine.—We presume that the white lead which you found where your lead pipe was in contact with the cement was formed all the way up your pipe, and fell down to the bottom.

N. B., of Conn.—You will probably get instructions where you buy the magenta dye, sufficient for a practical dyer. We believe that on woolens it is quite permanent.

J. W. H. Jr., of N. Y.—We know of no way to make glue insoluble in water. Gum shellac dissolved in alcohol makes a waterproof cement. If a room was completely filled with the vapor of petroleum to the exclusion of atmospheric air, a person could no more live in it than he could in water; but we have no idea the vapor in moderate quantities is perceptibly injurious.

G. E. T., of N. J.—We have never made any experiments with the springs of eight day clocks, and cannot tell you what weight one would sustain. It strikes us that you could attach weights to one yourself, and ascertain the amount very accurately.

J. H., of Pa.—The agent whom you have appointed to sell your invention must necessarily under the tax law, have a license which will cost $10. It may appear to you hard to tax patentees, but the real fact is Government must have money from every source from which it can be obtained, and the taxes seem to be very generally distributed. It is not the policy of the Government to tax any branch of business unjustly.

C. C., of Pa.—In your application for a re-issue, you can claim only what was shown in your original model. Send on your patent and let us examine it.

J. R. C., of Wis.—To stain wood red take one pound of Brazil wood to one gallon of water, boil three hours with one ounce of pearlash, brush it hot on the wood and while hot brush the wood with a solution made with two ounces of alum in one quart of water.

Inquirer, R. B., and A. S. W.—We cannot obtain the information you seek without more trouble than it is worth to us or you.

Money Received.

At the Scientific American Office, on account of Patent Office business, from Wednesday, July 27, 1864, to Wednesday, Aug. 3, 1864:—

P. P. I., of Ill., $25; M. R., of N. Y., $25; D. C. A., of Iowa, $5; E. H., of N. Y., $31; W. G. S., of Pa., $25; H. L., of Ind., $25; C. P., of Ohio, $25; S. C. R., of Maine, $16; T. E. R., of N. Y., $16; J. T., of N. J., $16; J. H., of Ohio, $25; R. H., of Conn., $10; T. W., of Ill., $15; H. C. S., of Ill., $25; H. G. D., of Ky., $50; W. H. B., of Iowa, $16; H. P. C., of Mich., $20; I. & W., of Ill., $16; J. C., of N. Y., $30; M. H. M., of Ohio, $25; J. C. C., of N. Y., $25; R. P. G., of Wis., $16; E. C., of Mass., $15; H. & R., of Cal., $60; E. C. S., of Maine, $25; I. N. V., of Cal., $15; J. B., of R. I., $25; J. W. P., of Maine, $20; I. G., of Pa., $16; P. M. R., of Cal., $13; H. N., of R. I., $16; S. & B., of Conn., $25; J. H. V., of Conn, $15; W. H. A., of N. Y., $20; G. M., of Conn., $51; C. A. C., of Iowa, $41; A. S. B., of N. Y., $59; W. J., of N. Y., $16; F. G. F., of Ill., $20; D. P., of R. I., $20; A. W., of Vt., $20; I. P. T., of N. Y., $20; E. C., of N. Y., $16; J. W. B., of Mass., $16; J. A. Jr., of Ill., $20; G. B. P., of N. Y., $20; J. H. M., of N. Y., $38; H. & C., of N. Y., $31; W. F., of Mass., $20; C. & W., of N. Y., $20; W. W., of N. J., $15; J. K., of England, $25; W. & V., of N. J., $20; J. F., of N. Y., $15; C. H. R., of R. I., $20; J. F. R., of Conn., $15; B. T. R., of Conn., $20; C. A. C., of Pa., $250; A. K. Jr., of N. Y., $20; J. W. M., of N. Y., $50; B. K., of Pa., $15; M. C. B., of Ind., $25; F. M., of Ind., $25; McI. & M., of Mich., $25; C. V. S., of Ill., $16; J. D., of Ill., $16; C. & S., of Mass., $25; J. W. M., of N. Y., $50; N. T., of N. H., $31; G. C. B., of Ill., $75; W. A. O., of N. Y., $25; B. Z., of Cal., $30; H. T. L., of N. J., $28.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, stating the amount and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office, from Wednesday, July 27, 1864, to Wednesday, Aug. 3, 1864:—

C. V. S., of Ill.; F. M., of Ill.; M. C. B., of Ind.; McI. & M., of Mich.; J. D., of Ill.; C. & S., of Mass.; J. Z., of Cal.; S. & B., of Conn.; H. L., of Ind.; J. B. G., of Ohio; M. R., of N. Y.; H. C. S., of Ill.; W. G. S., of Pa.; J. C., of N. Y.; E. H., of N. Y.; C. P., of Ohio; P. P. J., of Ill.; J. B., of R. I.; P. M. R., of Cal.; J. W. P., of Maine; E. C. S., of Maine; J. C. C., of N. Y.; M. H. M., of Ohio; T. S., of Pa.; D. C. A., of Iowa; M. M., of Paris; J. G. B., of N. Y.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and enclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

RATES OF ADVERTISING.

TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will err on in that ten words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

ARMY SUPPLIES.

OFFICE OF ARMY CLOTHING AND EQUIPAGE,
No. 502 Broadway, New York, Aug. 1st, 1864.

SEALED PROPOSALS WILL BE RECEIVED AT this office until 12 M., on Thursday, the 11th instant, for delivery by contract, at the Depot of Army Clothing and Equipage in this city,—

Sewed Bootees.
Pegged Bootees.
Sewed Boots.
Pegged Boots.

Samples of which can be seen at this office. Bidders will state the quantity they wish to furnish, and how soon they can complete the delivery of the quantity they bid for. They will submit, with their proposals, a sample of the article they propose to furnish.

A proper guaranty must accompany all bids for the faithful performance of a contract.

The United States reserves the right to reject any part or the whole of the bids as may be deemed for the interest of the service.

Proposals should be endorsed "Proposals for furnishing (here insert the name of the article bid for") and addressed to

1 LT.-COL. D. H. VINTON, Dy. Qr. Mr. Genl.

CHEAP SKATES.—PATENT FOR SALE OR INTEREST wanted. German Pattern Skates for 15 cents gold and upwards. Address E. V., Williamsburgh, N. Y. 1*

BRASS PINION WIRE FOR GAS AND WATER Meter-makers made by PETER COLLIE, Clock Maker, No. 1,176 South 11th street, Philadelphia, Pa. Also Indicators for counting the revolutions of Machinery. Electric Telegraph Instruments of any kind of fine brass. Wheel works made to pattern. 7 7*

TO OVAL FRAME MANUFACTURERS.—WE CALL attention to a very superior Patented Eccentric Lathe and Machine for cutting oval and circular frames. For Machines and rights to use apply to ROBERT MARCHER & BRO., 221 West 26th street, between 8th and 9th avenues, where they can be seen in operation. 7 4*

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PROPOSALS FOR HORSE EQUIPMENTS.

ORDNANCE OFFICE,
WAR DEPARTMENT,
WASHINGTON, D. C., July 28, 1864.

Proposals will be received by this department until Friday, Aug. 12th, 1864, at 4 P. M., for the delivery at the following arsenals of Horse Equipments, United States cavalry pattern, as hereinafter stated:—

At the New York Arsenal, 10,000.
At the Frankfort Arsenal, 6,000.
At the Alleghany Arsenal, 6,000.
At the St. Louis Arsenal, 3,000.

These sets of horse equipments are to be furnished complete, with the exception of horse brush, curry-comb, lariat, picket pin, link, nose bags, spurs, and straps, blankets, watering bridle, and sweat leather. The curb bits and stirrups are to conform strictly in pattern and finish to those deposited at the above-named arsenals. The malleable iron trimmings are to be japanned The trees are to be of the regulation pattern, assorted sizes, not less than 3½ inches between the bars on the inside of the pommel; the side bars of hard white wood or beech; the pommel and cantles of beech, well put together. All the irons are to be one-tenth of an inch thick, and all let into the wood, to be covered with the best slaughtered cow hide. All other coverings will be rejected. The halters are to be riveted with twelve No. 12 copper rivets, as shown in samples. The bridle rein is to be seven-eighths of an inch wide, and made as per sample. The girth strapping to be riveted. The two D rings to have a stop; two rivets in each end of the girth; no cross sewing; and all the stitching throughout the sets will not be less than eight stitches to the inch. The stirrup hoods will be omitted. The carbine socket strap is to be riveted with two No. 12 copper rivets. The trees are to be subject to inspection during all stages of their manufacture, and, if deemed necessary, the leather to be used in the fabrication of these equipments to be inspected before cutting.

The final inspection will be made at the arsenal where delivered.

Deliveries must be made in lots of not less one-tenth per week of the whole amount contracted for, the first delivery to be made on the ——

Failures to make deliveries at a specified time will subject the contractor to a forfeiture of the number he may fail to deliver at that time.

No bids will be considered from parties other than regular founders, or proprietors of works who are known by this Department to be capable of executing in their own shops the work proposed for.

Bidders will state explicitly the Arsenal at which they propose to deliver, and the number of sets they propose to deliver at each place, if for more than one.

Forms of bids can be obtained at the above-named Arsenals, or at this office. Proposals not made out on this form will not be considered.

GUARANTY.

The bidder will be required to accompany his proposition with a guaranty signed by two responsible persons, that, in case the bid is accepted, he will at once execute the contract for the same, with good and sufficient sureties, in a sum equal to the amount of the contract, to deliver the article proposed, in conformity with the terms of this advertisement; and in case the said bidder should fail to enter into the contract, they to make good the difference between the offer of said bidder and the next responsible bidder, or the person to whom the contract may be awarded.

The responsibility of the guarantors must be shown by the official certificate of the Clerk of the nearest District Court, or of the United States District Attorney.

Bonds in the sum equal to the amount of the contract, signed by the contractor and both of his guarantors, will be required of the successful bidder or bidders upon signing the contract.

FORM OF GUARANTY.

We, the undersigned, residents of ——————, in the county of —————— and State of ——————, hereby jointly and severally covenant with the United States and guarantee, in case the foregoing bid of —————— —— be accepted, that he or they will at once execute the contract for the same, with good and sufficient sureties, in a sum equal to the amount of the contract, to furnish the articles proposed in conformity with the terms of this advertisement, dated July 28, 1864, under which the bid was made; and, in case the said —————— —— shall fail to enter into a contract as aforesaid, we guarantee to make good the difference between the offer of the said —————— —— and the next lowest responsible bidder, or the person to whom the contract may be awarded.

Witness: { Given under our hands and seals this —— day of —, 186—.

[Seal.]
[Seal.]

Proposals will be addressed to "Brigadier-General George D. Ramsay, Chief of Ordnance, Washington, D. C.," and endorsed "Proposals for Horse Equipments."

GEORGE D. RAMSAY,
Brigadier-General, Chief of Ordnance.

7 2

WANTED.—AN AUTOMATIC LATHE FOR TURNING Handles for Buckets, &c. JAS. S. HANN & CO., Cincinnati, Ohio. 7 2*

WANTED—A PURCHASER FOR, OR AN AGENT IN New York city to sell, two valuable unpatented improvements. Address, with good references, JOHN B. LOGAN, Kirk's Roads, Clinton county, Ind. 1*

A VALUABLE PATENT FOR SALE. ADDRESS S. M. GOFF, East Addison, Addison county, Vt. 7 6*

THE RIGHT TO MANUFACTURE THE ST. CLAIR Harvester and my Patent Grain Drill, can be had on easy terms. W. P. PENN, Belleville, Ill. 7 6*

CIGAR LIGHTERS.—A VALUABLE INVENTION has been made by H. REIMAN, of this city, in making Cigar Lighters that will answer all the requirements of smokers, and thus become a profitable article of manufacture. These matches possess none of those objectionable features which all others do. They can be made cheap enough for every body. They do not burn with smelling fumes so objectionable to cigar-smokers, but are quickly transformed into a burning coal, retaining heat enough to light two cigars or pipes. They are kept in a metallic box, made by the inventor on purpose to light cigars easily and without burning the fingers. The following calculations will show to manufacturers the value of these matches. Assuming the number of smokers in the loyal States only to be four millions, the daily consumption of these matches would certainly be ten millions. Allowing one-half cent net profit per box, containing one hundred matches, the amount would be $500 per day, or $182,500 per year, and in 17 years $3,102,500. The inventor intends to sell his patent right in parts or whole. For further information address A. F. SCHLEGEL at the SCIENTIFIC AMERICAN Office, 37 Park Row, New York. 7 2*

PARTNER WANTED.—TO INVEST $10,000 IN THE manufacture of Patent Steam and Force Pumps of a superior description, with reputation and market already established in the States and in South America. The business requires to be conducted on a larger scale. The owner proposes to give one-half interest to an acceptable party. For further information address W. M. H., Box 212, Post-office, Baltimore, Md. 1*

RENSSELAER POLYTECHNIC INSTITUTE, TROY, N. Y. The Forty-first Annual Session of this well-known School of Engineering and Natural Science, will commence Sept. 14th, 1864. The Principal Building is completed and ready for occupation. The New Annual Register, giving full information, may be obtained at Appleton's Bookstore, New York, or from Prof. CHARLES DROWNE, Director, Troy, N. Y. 6 8*

CAVALRY HORSES WANTED.

CAVALRY BUREAU, OFFICE OF ASSIST. QUARTERMASTER,
No. 18 State street, New York, June 10, 1864.

I WILL PURCHASE IN OPEN MARKET ALL THE Calvary Horses that may be presented and pass inspection at the Government Stables, corner of 10th avenue and 25th street, in this city, until further notice.

Payment will be made in checks payable in certificates of indebtedness, when seven (7) or more horses are received. Price, one hundred and sixty dollars each.

6 tf GEO. A. BROWNING, Capt. and Assist. Qr. Mr.

INCRUSTATION.—EIGHT YEARS' USE OF THE "Anti-Incrustation Powder" stamps it a standard article, effective and safe in its operations.

6 6* H. N. WINANS, 11 Wall street, New York.

THE CHEAPEST MODE OF INTRODUCING INVENTIONS.

INVENTORS AND CONSTRUCTORS OF NEW AND useful Contrivances or Machines, of whatever kind, can have their inventions illustrated and described in the columns of the SCIENTIFIC AMERICAN on payment of a reasonable charge for the engraving.

No charge is made for the publication, and the cuts are furnished to the party for whom they are executed as soon as they have been used. We wish it understood, however, that no second-hand or poor engravings, such as patentees often get executed by inexperienced artists for printing circulars and handbills from, can be admitted into these pages. We also reserve the right to accept or reject such subjects as are presented for publication. And it is not our desire to receive orders for engraving and publishing any but good Inventions or Machines, and such as do not meet our approbation in this respect, we shall decline to publish.

For further particulars address—

MUNN & CO.,
Publishers of the SCIENTIFIC AMERICAN,
No. 37 Park Row, New York City.

TWIST DRILLS.—ALL SIZES OF STUB'S WIRE Drills; also Twist Drills for machinists' use, varying in diameter by 32nds from ⅛-inch to 1½-inch, together with sockets to fit them. For sale by the "Manhattan Fire Arms Company," corner of High and Orange streets, Newark, N. J. 5 4*

NEW APPARATUS FOR MAKING NITROUS OXIDE chemically pure. Needs no watching, and breaks no glass. Pure Nitrate Ammonia, yielding eight gallons per lb. more than the ordinary. Rare Chemicals and Apparatus for experimenters. A. W. SPRAGUE, 89 Washington street, Boston. 5 4*

SOMETHING OF IMPORTANCE.

Having obtained Letters Patent for tanning Leather without Bark, and said patent having been submitted to the severest test, and giving entire satisfaction, as affidavits in my possession will affirm, different persons bought rights who were not tanners, but having strictly adhered to the instructions accompanying such right have been enabled to make the best of leather, in quick time, and at less expense than can be done with bark. The Patentee is a practical tanner, and will send all necessary instructions to any person buying a right. State, County, Town, and Shop Rights for sale. Agents wanted, and good inducement. For further information address ALEXANDER HILL, Patentee, Dubuque, Iowa. 5 3*

ALCOTT'S CONCENTRIC LATHES.—FOR BROOM, Hoe, and Rake Handles, Chair Rounds, &c.—Price $25; and all other kinds of Wood-working Machinery, for sale by S. C. HILLS, No 12 Platt street, New York. b

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HEYER'S POCKET SEWING MACHINE.—ILLUSTRATED in No. 5, current volume, SCIENTIFIC AMERICAN. State and County Rights for sale. Address W. D. HEYER, Box 762, New Orleans, La. 5 4*

ENGINEERS AND MACHINISTS WANTED FOR the United States Navy. Positions guaranteed before the 1st of September. Address, with two stamps, J. HARRIS, 355 North 10th street, Philadelphia. 6 6*

FOR SALE.—IN THE NEIGHBORHOOD OF NEW York, Building and Lot, with Steam-power, used at present as a Chemical Factory. Apply to L. GAIL, 103 Maiden Lane, New York. 6 2*

ARMY SUPPLIES.

OFFICE OF ARMY CLOTHING AND EQUIPAGE,
502 BROADWAY, NEW YORK, July 28th, 1864.

SEALED PROPOSALS WILL BE RECEIVED AT this Office until 12 o'clock, M., on Thursday the 11th of August for the delivery by contract at the Depot of Army Clothing and Equipage in New York City,

Army Blankets of domestic manufacture Wool, Gray, (with letters U. S. in black 4 inches long in the center) to be 7 feet long and 5 feet 6 inches wide to weigh 5 pounds each.

Bidders will state the number they wish to furnish, how many they can deliver per week, when they can commence and when they can finish their deliveries.

All proposals must be accompanied by a proper guaranty, signed by two responsible parties, setting forth that if a contract is awarded to the party named therein he will at once execute the same, and give bonds for its faithful performance.

The United States reserves the right to reject all bids deemed objectionable.

Proposals should be endorsed "Proposals for furnishing Blankets" and addressed to LT-COL. D. H. VINTON, Dy. Qr. Mr. Genl.

6 2

FOR SALE.—ONE PULLEY, 80 INCHES DIAMETER, 24-inch face, bored for 3⅞-inch shaft. Apply to "Providence Tool Company," Providence, R. I. 4 tf

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NOTICE.—PARTIES HAVING EITHER AN IMproved Thrashing Machine, Farm Mill, or Cotton Gin to be introduced, may address "Patent Horse-power Company," 1,509 Pennsylvania avenue, Philadelphia. 4 6*

OIL! OIL! OIL!

For Railroads, Steamers, and for machinery and Burning, PEASE'S Improved Engine and Signal Oil, indorsed and recommended by the highest authority in the United States. This Oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior to and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The "Scientific American," after several tests, pronounces it "superior to any other they have used for machinery." For sale only by the Inventor and Manufacturer, F. S. PEASE, No. 61 Main street, Buffalo, N. Y.

N. B.—Reliable orders filled for any part of the United States and Canada. 4 tf

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NAME PLATES FOR INVENTORS AND MANUfacturers made neatly by SMITH & BUTLER, 49 Broome street, New York.

N. B.—Quantities made at reduced rates. 4 4*

GALVANIZED IRON.—GALVANIZING DONE WITH despatch and castings furnished if desired, either *Malleable* or *Gray* iron. Address, WILCOX & HALL, Middletown, Conn. 16 12eow*

HARRISON'S GRIST MILLS.—20, 30, 36, AND 48 inches diameter, at $100, $200, $300, and $400, with all the modern improvements. Also, Portable and Stationary Steam Engines of all sizes, suitable for said mills. Also Bolters, Elevators, Belting, &c. Apply to S. C. HILLS, No. 12 Platt street, New York. d

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AMESSIEURS LES INVENTEURS.—AVIS IMPORTANT Les inventeurs non familiers avec la langue Anglaise, et qui préféreraient nous communiquer leurs inventions en Français, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront reçues en confidence. MUNN & CO.,
Scientific American office, No. 37 Park Row New York

VALUABLE WORK FOR INVENTORS PATENTEES AND MANUFACTURERS.

The publishers of the SCIENTIFIC AMERICAN have just prepared with much care, a pamphlet of information about Patents and the Patent Laws, which ought to be in the hands of every inventor and patentee, and also of manufacturers who use patented inventions. The character of this useful work will be better understood after reading the following synopsis of its contents:—

The complete Patent Law Amendment Act of 1861—Practical Instructions to Inventors, how to obtain Letters Patent, also about Models—Designs—Caveats—Trade-marks—Assignments—Revenue Tax—Extensions—Interferences—Infringements—Appeals—Re-issues of Defective Patents—Validity of Patents—Abandonment of Inventions—Best Mode of Introducing them—Importance of the Specification—Who are entitled to Patents—What will prevent the granting of a Patent—Patents in Canada and European Patents—Schedule of Patent Fees; also a variety of miscellaneous items on patent law questions.

It has been the design of the publishers to not only furnish, in convenient form for preservation, a synopsis of the PATENT LAW and PRACTICE, but to answer a great variety of questions which have been put to them from time to time during their practice of upwards of *seventeen years*, which replies are not accessible in any other form. The publishers will promptly forward the pamphlet by mail, on receipt of six cents in postage stamps.

Address MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, No. 37 Park Row New York.

THE SEVENTEENTH ANNUAL EXHIBITION OF the Maryland Institute of Baltimore, for the promotion of the Mechanic's Arts, will commence Monday evening, Oct. 3d, and continue to Monday evening, Oct. 31st, 1864. The Hall will be open for the reception of goods on Monday, Sept. 26th. Goods for competition and premium must be deposited before Thursday night, Sept. 29th. Circulars, embracing details, may be had of the Actuary at the Institute. Communications addressed to the undersigned, or to WM. C. CORNTHWAITE, Actuary, will be promptly attended to.

3 11 W. W. MAUGHLAN, Chairman Committee on Exhibition.

FOR SALE BY THE GREAT CENTRAL FAIR, Philadelphia, Pa., one pair Ericsson Caloric Engines, 24-inch cylinders, suitable for a printing office. Price $1,500. Inquire of J. P. MORRIS TOWNE, & CO., Philadelphia, Pa.; or S. V. MERRICK, Philadelphia, Pa. 3 6

ENGINEERING, CIVIL AND MILITARY; CHEMISTRY, Metallurgy, Assaying, &c., at Union College, Schenectady, N. Y. For Circular address Registrar. 24 1y*

SAVING OF FUEL TO PARTIES USING STEAM.—DAMPER REGULATORS.

Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms of flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 5 Park Place, New York. 3 26*

WATER WHEELS.—STEVENSON'S HELICAL Turbine, on horizontal shaft for very high falls, and vertical shaft for ordinary falls. Combining the Helix with the Jonval Wheel proper, with friction step above the wheel. A very durable wheel, giving a high result at moderate cost. Address J. E. STEVENSON, 200 Broadway, New York. 4 4*

PLATINA PLATE AND WIRE.—IMPORTED AND for sale by SAMUEL S. WHITE, Dental Depot, 658 Broadway, New York. 5 4*

DRAFTING INSTRUMENTS FOR ENGINEERS, SURveyors, Architects, Machinists, and Schools, Engineers' and Surveyors' transits, levels, compasses, and chains, Chesterman's Metallic and Steel Tape-measures, for sale, wholesale and retail, by JAMES W. QUEEN & CO., 924 Chestnut street, Philadelphia. Priced and illustrated catalogues gratis. 21 12*

NERVOUS DISEASES AND PHYSICAL DEBILITY, arising from Specific causes in both sexes—new and reliable treatment, in Reports of the Howard Association—sent in sealed letter envelopes, free of charge. Address Dr. J. SKILLIN HOUGHTON Howard Association, No. 2 South Ninth street, Philadelphia, Pa. 1 12*

POWER LOOMS FOR SALE.—SIXTEEN SATINETT Looms, together with lot of pulleys and hangers. Manufactured by Alfred Jenks & Son. Address LOCK, Box 70, Lexington, Ky. 4 7*

IRON PLANERS, ENGINE LATHES, DRILLS AND other machinists' tools, of superior quality, on hand and finishing, for sale low. For description and price address NEW HAVEN MANUFACTURING COMPANY, New Haven, Conn. 1tf

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HOLSKE & KNEELAND, MODEL MAKERS. PATENT Office Models, Working Models, and Experimental Machinery, made to order at 100 Walker street, between Center and Elm, New York. Refer to Munn & Co., SCIENTIFIC AMERICAN Office. 1tf

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GROVER & BAKER'S HIGHEST PREMIUM ELASTIC Stitch Sewing Machines, 495 Broadway, New York. 1 tf

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MANUFACTURERS OF STEAM ENGINES, WITH the link motion, variable cut off of the most approved construction; also Lathes, Mill-gearing, Shafting, Hangers and Machinery in general. Address M. & T. SAULT, New Haven, Conn. 19 26*

GUN AND PISTOL SCREWS.—COMSTOCK, LYON & CO., Manufacturers (Office, 74 Beekman street, New York), are always prepared to furnish Gun and Pistol Screws to sample. Screws to fit the U. S. Musket, Sewing Machine Screws, and Metal Screws generally, of the best quality, at short notice. 10 26*

REYNOLDS' TURBINE WATER WHEELS.—COMPETENT men are employed to measure streams, make plans, and put in flumes, wheels, and gearing. TALLCOT & UNDERHILL, No. 170 Broadway, New York. 1tf

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JAMES HORNER & CO., MANUFACTURERS OF CAST Steel and Files. Orders solicited for all kinds, shapes and sizes, Office and Warehouse, 28 Cliff street, New York. 7 6m*

THEYSON & OGG, 39 GREENE STREET, NEAR Grand street, Machinists, Brass Finishers, and Model Makers Experimental Machinery, Indicators, Registers, and Steam Gages of any kind accurately and promptly made. 22 12*

Zur Beachtung für deutsche Erfinder.

Die Unterzeichneten haben eine Anleitung, die Erfindern das Verhalten angiebt, um sich ihre Patente zu sichern, herausgegeben, und verabfolgen solche gratis an dieselben.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu adressiren an

Munn & Co.,
37 Park Row, New-York.

Auf der Office wird deutsch gesprochen.

Daselbst ist zu haben:

Die Patent-Gesetze der Vereinigten Staaten,

nebst den Regeln und der Geschäftsordnung der Patent-Office und Anleitungen für den Erfinder, um sich Patente zu sichern, in den Ver. Staaten sowohl als in Europa. Ferner Auszüge aus den Patent-Gesetzen fremder Länder und darauf bezügliche Rathschläge; ebenfalls nützliche Winke für Erfinder und solche, welche patentiren wollen.

Preis 20 Cts., per Post 25 Cts.

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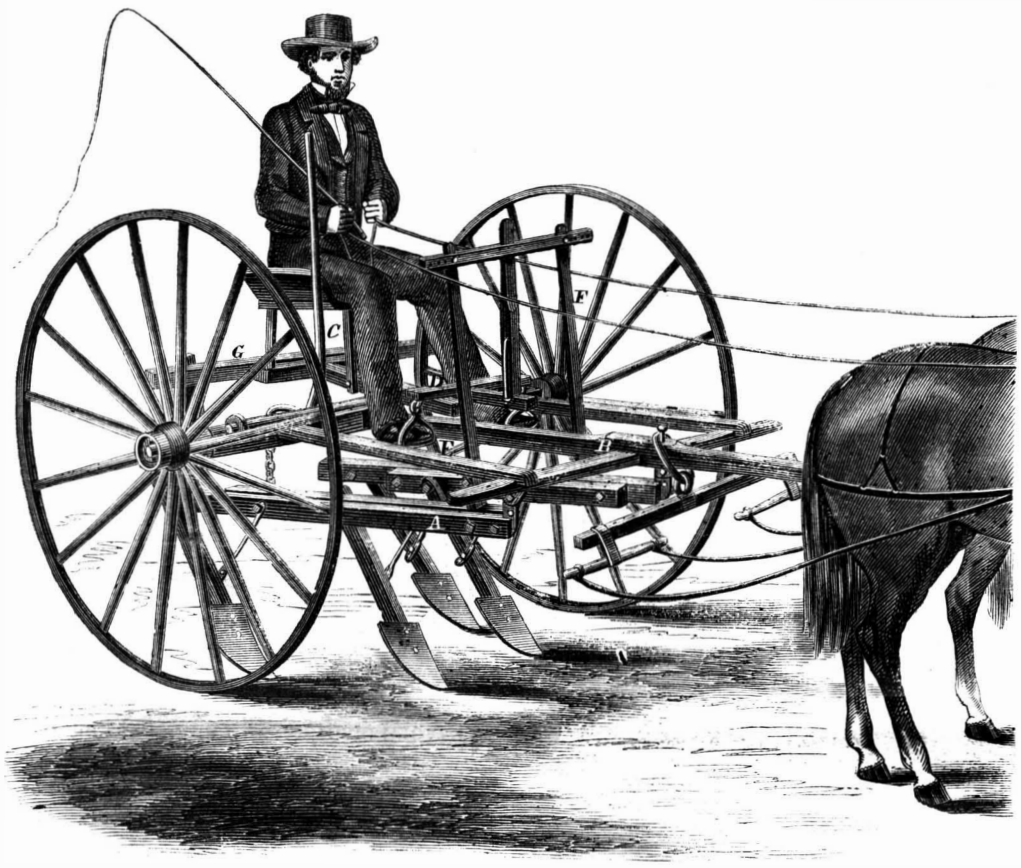
Improved Adjustable Cultivator.

This agricultural implement is intended for cultivating standing crops, and is so arranged that the plows or cultivators are easily changed in their courses and made to conform to the irregularities of the rows, so that the plants will not be injured, or plowed up entirely, as some times happens. The invention consists in mounting a gang of plows on beams, A. These beams are hinged to the forward end of the frame, B, so that they readily rise and fall when the lever, C, is moved forward or back, thus enabling the driver to control the depth to which the plows work. The lateral or side adjustment of the plows is effected by the feet of the driver,

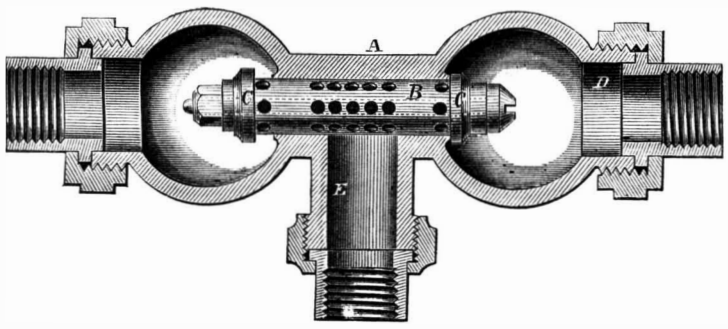


DOAKS ADJUSTABLE CULTIVATOR.

thus leaving his hands free to guide the team. The treadle, D, has two stirrups, E, in which the feet rest. This treadle communicates by the arms, F, with the plow-beams, so that they are moved sidewise across the furrow. The beam, G, behind is merely to connect the two gangs together. This is an efficient and easily managed machine, and a patent is now pending on it through the Scientific American Agency. For further information address the inventor, John Doak, at Keithsburgh, Ill.

Improved Steam Trap.

The water which condenses in steam cylinders and



VAESSEN'S STEAM TRAP.

in all places where steam is used, whether as motive power or for heating buildings, is a source of annoyance and not unfrequently disaster. This is the case in steam engines, for when they stand still over night, or during the intermission at noon, water collects in greater or less quantities, which if not removed is liable to knock out the cylinder head at the first stroke of the piston—very many engines have been disabled from this cause. Cocks are usually provided for the relief of this trouble, but they are useless unless attended to by the engineer. The true remedy lies in the employment of an automatic or self-acting arrangement which shall relieve the cylinder without any supervision whatever.

This is provided by the apparatus shown in the engraving. The case, A, is furnished with a tube, B, which is perforated with holes. This tube slides in a seat bored for it in the case, the tube is longer than the length of the passage and has a valve, C, on each end. The action is as follows; steam is entering the trap from the passage, D, and consequently the valve, C, is blown forward on to its seat. The condensed water in the other end of the cylinder, therefore, runs out through the opening made by thetube into the discharge passage, E. This is the whole operation, and it is both simple and effective. The opposite ends of the trap connect with opposite ends of the steam cylinder, but it may be applied to any steam engine or heater of any kind whatsoever. Very many of them are now in use and are highly recommended. This trap was patented in this country through the Scientific American Patent Agency, on June 14, 1864, by Hubert Joseph Vaessen, of Luttich, Belgium, and assigned to Bernhard Schaffer and Christian Budenberg, of New York city; for further information address the assignees and manufacturers, at 61 Cedar street, New York.

Preservation of Wood.

A curious instance of the way in which wood is often preserved by the infiltration of metallic salts has just been brought before the French Academy by M. Payen. General Morin found in one of the abandoned copper mines of St. Domingo an old wooden wheel which had been employed for some mechanical purpose when the mine was formerly worked. The exact age of the wood no one seems to know, for there appears to be no record as to when the mine itself was in operation. The wood was analyzed by the distinguished chemist above-named, and was found by him to contain considerable quantities of iron and copper, to the antiseptic properties of which its preservation must be attributed. The wood not only absorbed the metallic solutions, but so operated on them when absorbed as to prevent their re-solution by water, the iron having been found in the form of subsulphate of the sesquioxide. The preserving power of such impregnation is best illustrated in the wood employed in the mines of Hallein in Austria; the timber used in these mines is the same which was originally introduced anterior to the Christian era, and is, even now, in a very perfect condition.

Mice gnaw harness for the salt contained in the perspiration exuded from the horse. To prevent the gnawing, place salt in places where the mice can get at it.

An old kid glove makes excellent lacing for securing small belts on sewing machines and other places. Cut the gloves in strips half an inch wide and roll them up tight.

THE

Scientific American,

FOR 1864!

VOLUME ELEVEN,

NEW SERIES.

The publishers of the SCIENTIFIC AMERICAN respectfully give notice that the Eleventh Volume (New Series) commenced on July 2d, 1864. This journal was established in 1845, and is undoubtedly the most widely circulated and influential publication of the kind in the world. In commencing the new volume the publishers desire to call special attention to its claims as

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